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FINAL Environmental Impact Statement for the Peabody Powder River Mining, LLC - Mackey Road Relocation

August 2013



Douglas Ranger District

Medicine Bow-Routt National Forests and Thunder Basin National Grassland

Campbell County, Wyoming

6th Principal Meridian

**Township 42 North, Range 69 West, Sections 6, 7, 8, 17, 21, 28, and 33; and
Township 43 North, Range 69 West, Sections 29, 30, and 31**

Responsible Official: Phil Cruz-Forest Supervisor

For Further Information Contact: Amy Ormseth, P.E.

Minerals & Lands Program Manager

Douglas Ranger District

Medicine Bow/Routt NFs & Thunder Basin NG

2250 E. Richards St.

Douglas, WY 82633

(307) 358-4690 (phone)

(307) 358-7107 (FAX)

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EXECUTIVE SUMMARY

The U.S. Forest Service (USFS) proposes to authorize Peabody Powder River Mining, LLC (PPRM) to relocate portions of the Mackey County Road (CR69) and Temporary Reno Road (CR83) on National Forest System (NFS) lands. After construction is complete, the USFS proposes to authorize an easement to Campbell County for use and maintenance of the new route as a county road. The new county road segment will maintain public access to private, state, and NFS lands east of projected mine activities.

The proposal includes construction and reconstruction of approximately 8.7 miles of county road constituting a new route for the Mackey Road. These activities will affect approximately 7.1 miles on NFS lands in Township 42 North, Range 69 West, Sections 6, 7, 8, 17, 21, 28, and 33; and Township 43 North, Range 69 West, Sections 29-31. Approximately 5.85 miles of those affected NFS lands will entail new road construction; the remaining 1.25 miles will involve reconstruction of the existing NFS Road #968 - School Creek Road. Once the project is complete, a 100-foot wide (50 feet either side of center) right-of-way easement will be processed to Campbell County. The total impacted acreage on NFS lands associated with this project is projected to be approximately 292.7 short-term acres (i.e., during construction) and 85.7 long-term acres (new infrastructure and post-construction maintenance within the easement to be transferred to the county). The design specifications for the new road will conform to current county road standards. Campbell County will maintain the road after the easement is complete.

Upon completion of the new road, approximately 6.1 miles of the existing Mackey Road within the North Antelope Rochelle Mine (NARM) State of Wyoming, Permit to Mine #569 boundary will be vacated. Approximately 2.2 miles of the Temporary Reno Road (8.3 total miles) also will be vacated where it overlaps the current NARM coal lease and/or permit area. Most vacated road segments will be mined through and subsequently reclaimed in accordance with conditions specified in NARM's state mining permit.

All construction disturbance associated with the project on NFS lands will occur within a 300-foot to 700-foot wide corridor on NFS lands; approximately 0.5 mile of the project will involve major cut/fill construction. Access to the construction area will be from existing roads and two-tracks or from within the new corridor as it is built. Access to sources of construction water may require surface pipelines and pumps to be delivered via light vehicles and laid across native ground surface on NFS lands. Such access and activities will be limited to existing roads or the use of surface pipelines carefully installed across public land to avoid excessive disturbance of native ground surfaces.

Surface disturbance within these corridors will include: overland travel of vehicles and equipment; topsoil removal, stockpiling, and replacement; cut/fill activities; road base placement and compaction; gravel surfacing; fencing; and reclamation of ancillary areas. Dust control practices (application of water) will be used during construction to minimize dust emissions. Slope erosion will be controlled by the use of slope angle reduction, re-application of topsoil, re-vegetation, and, possibly, the use of mechanical runoff control features such as contour ditches,

drop structures, etc. Standard reclamation techniques will be used to reclaim disturbed areas outside the final road easement. Engineered drainage structures consisting of multiple corrugated metal pipe or concrete box culverts will be installed to maintain post-construction habitat connectivity and prevent down-cutting and head-cutting where the road will cross Little Thunder Creek and School Creek.

Purpose and Need

The USFS has identified a *need* for authorizing PPRM to conduct the activities associated with the relocation of a segment of Campbell County's Mackey Road and the Temporary Reno Road to allow NARM to fully develop existing federal coal leases WYW-179011, WYW-0321779, WYW-172413, WYW-172414, and WYW-151134, subject to the Mineral Leasing Act. The existing condition is that portions of these two roads overlie mineable coal within NARM's existing federal coal lease boundary. Full development of the federal coal leasing obligation will require that coal lying beneath those road segments be mined. The desired condition is to mine the coal beneath the roads, yet maintain public travel services provided by the roads. The *purpose* of this action is to relocate those road segments outside the area to be mined in advance of mining and turn the relocated route over to Campbell County jurisdiction so that the underlying coal can be mined and public road services remain uninterrupted.

The project is in the administrative boundary of the Thunder Basin National Grassland, Douglas Ranger District, approximately 16.5 miles southeast of Wright, Campbell County, Wyoming.

The terrain in the project area and immediately surrounding lands consists primarily of gently rolling, open grasslands with more limited areas of sagebrush. More rugged scoria outcrops creating steeper terrain and a few small stands of ponderosa pine (*Pinus ponderosa*) also are present. All drainages are semi-perennial (due to perennial springs), intermittent, or ephemeral; no true perennial streams are present in the project area.

The majority of the project is located in the Highlight Bill Geographic Area. Minerals exploration and development and livestock grazing will be significant management activities in this geographic area. In some areas, restrictions on public use may be applied to ensure public safety and to avoid unreasonable interference with mineral operations. In those areas where mining is emphasized, reclamation activities will restore the area to a reasonable level of its pre-mining condition. Approximately 1.6 non-contiguous miles of the construction corridor will cross NFS lands in the Broken Hills Geographic Area; specifically, the General Forest and Rangelands: Range Vegetation Emphasis (5.12) Management Area. This area is managed primarily for the sustainability of physical, biological, and scenic values associated with woody vegetation and open grassland. Management emphasis targets a balance of resource uses and opportunities, such as livestock grazing, wildlife habitat, dispersed recreation, minerals management, and timber harvest, among others.

Scenery Management System objectives for the majority of the project area are to design and implement management activities, facilities, and landscape modifications to be visible but reasonably mitigated to blend with the natural features and landscape. However, the primary scenic resources objective is modification, a classification that allows management activities and

mineral development such as coal mines, railroads, oil and gas wells, and pipelines to visually dominate the original characteristic landscape. Therefore, more development, a moderate number of facilities, higher fence densities, and intensive mineral development also may occur in the majority of the project area, particularly in the Hilgert Bill Geographic Area.

Primitive conditions with minimal facility development are emphasized for the Broken Hills Geographic Area, as a whole. In the portion of the geographic area that overlaps the project area (i.e., Management Area 5.12), management emphasis is on balancing resource uses and opportunities, such as livestock grazing, wildlife habitat, dispersed recreation, minerals management, and timber harvest. Where mineral development occurs, activities are designed to be visually subordinate to the landscape in the mid- and background. Signs of motorized travel, hunting, hiking, timber harvest, mining, and livestock grazing may be evident.

Livestock grazing is the dominant land use throughout the project area, regardless of the geographic area. Minimal recreational use also occurs there. The Recreation Opportunity Spectrum class for the project area is semi-primitive motorized.

Wildlife species such as black-tailed prairie dogs (*Cynomys ludovicianus*), mule deer (*Odocoileus hemionus*), antelope (*Antilocapra americana*), mountain plover (*Charadrius montanus*), sage-grouse (*Centrocercus urophasianus*) and multiple raptor species inhabit sagebrush and grassland communities the area. Species identified by the USFS as management indicator species (MIS) for both geographic areas have been addressed in the Biological Evaluation section of this document.

A cultural resource survey of the area has been completed. Sites identified during the survey must and will be protected in accordance with State Historic Preservation Office direction.

This final environmental impact statement (FEIS) documents and discloses the effects analyses for the proposed PPRM Mackey Road Relocation project. Through this assessment process, the USFS will determine where and under what term(s) and condition(s) PPRM may relocate the Mackey Road and Temporary Reno Road onto NFS land, while providing for protection of natural resources, as well as public access and safety.

Decisions To Be Made

Through the environmental analysis process, the Forest Supervisor will review the alternatives analyzed in this FEIS, and then determine whether or not and, if so, where and under what conditions, the proposed activities would be authorized.

ABBREVIATIONS AND ACRONYMS

AQD	Air Quality Division
ARCADIS	Arcadis U.S., Inc.
AVF	alluvial valley floors
BA/BE	Biological Assessment/Biological Evaluation
BLM	U.S. Bureau of Land Management
BMP	best management practices
CBNG	coal bed natural gas
CCA	candidate conservation agreement
CCAA	candidate conservation agreement with assurances
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CM	centimeter
CO	carbon monoxide
CO ₂	carbon dioxide
CO _{2e}	equivalent CO ₂
CR	county road
dv	deciview
EIS	environmental impact statement
EPA	U.S. Environmental Protection Agency
FEIS	final environmental impact statement
FLPMA	Federal Land Policy and Management Act
FSH	Forest Service Handbook
FYPC	fossil yield potential classification
GCM	GCM Services, Inc.
GHG	greenhouse gas
GIS	geographic information system
GPS	global positioning system
HNO ₂	nitrous acid
HNO ₃	nitric acid
LBA	lease by application
LRMP	Land and Resource Management Plan
MA	management area

MIS	management indicator species
MM	millimeter
MW	megawatts
NAAQS	National Ambient Air Quality Standards
NARM	North Antelope Rochelle Mine
NEPA	National Environmental Policy Act
NFS	National Forest System
NO ₂	nitrogen dioxide
NO _x	nitrogen oxides
NRCS	Natural Resource Conservation Service
NRHP	National Register of Historic Places
NWSGWG	Northeast Wyoming Sage-grouse Local Working Group
PAB	palustrine aquatic bed
PEM	palustrine emergent
PM	particulate matter
PM _{2.5}	particulate matter measuring 2.5 micrometers or less in diameter
PM ₁₀	particulate matter measuring 10 micrometers or less in diameter
PPRM	Peabody Powder River Mining, LLC
PRB	Powder River Basin
PSD	prevention of significant deterioration
ROD	record of decision
SHPO	State Historic Preservation Office
SO ₂	sulfur dioxide
SOPA	schedule of proposed actions
TBCC	Thunder Basic Coal Company
TBNG	Thunder Basin National Grassland
T&E	threatened and endangered species
USACOE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFS	U.S. Department of Agriculture Forest Service
USFWS	U.S. Fish and Wildlife Service
VOC	volatile organic compounds
WDEQ	Wyoming Department of Environmental Quality
WGFD	Wyoming Game and Fish Department

DOCUMENT STRUCTURE

The U.S. Forest Service (USFS) has prepared this final environmental impact statement (FEIS) in compliance with the National Environmental Policy Act and other relevant federal and state laws and regulations. This document discloses the direct, indirect, and cumulative environmental impacts that will result from the Proposed Action and other alternatives. The document is organized into five chapters:

Chapter 1. Purpose and Need for Action: This chapter includes management prescriptions for the project area; the purpose and need for the project; and a summary of the agency's proposal for achieving that purpose and need. This section also details how the USFS informed the public of the proposal and how the public responded.

Chapter 2. Alternatives, including the Proposed Action: This chapter provides a more detailed description of the agency's Proposed Action, as well as alternative methods for achieving the stated purpose. These alternatives were developed based on significant issues raised by the public and other agencies. This discussion also includes mitigation measures based on USFS requirements and the TBNG Land and Resource Management Plan Standards and Guidelines. Finally, this section provides a summary table of the environmental consequences associated with each alternative.

Chapter 3. Affected Environment and Environmental Consequences: This chapter describes the environmental effects of implementing the Proposed Action and other alternatives. Cumulative effects, which are reasonably foreseeable future actions conducted by any entity, of the Proposed Action also are discussed. Chapter 3 is organized into sections based on the following environmental resources: Heritage-Cultural Resources, Paleontological Resources, Wildlife Resources, Vegetation Resources, Soils, Hydrology, Land Use, Air Quality, and Economic and Social Conditions.

Chapter 4. Consultation and Coordination: This chapter provides a list of preparers and agencies consulted during the development of the FEIS.

Chapter 5. Literature Cited: This chapter lists literature referenced in the FEIS.

Appendices: The appendices provide descriptions of goals, objectives, standards, and guidelines relevant to the project, as well as more detailed information (including exhibits) to support the analyses presented in the FEIS.

Additional documentation may be found in the project planning record located at the Douglas Ranger District Office at 2250 East Richards Street, Douglas, Wyoming, 82633.

CHAPTER 1. PURPOSE OF AND NEED FOR ACTION

1.1 Geographic Area Direction

The Thunder Basin National Grassland (TBNG) is comprised of approximately 572,000 acres of National Forest System (NFS) lands intermingled with over 1 million acres of private and state lands. The TBNG is divided into six Geographic Areas. Geographic Areas include management direction that is too specific to apply across the entire grassland or across several grasslands. The Proposed Action is mostly within the Hilight Bill Geographic Area, with approximately 1.6 non-contiguous miles crossing the western border of the Broken Hills Geographic Area.

Geographic Areas and Management Areas are depicted on the Alternative 3 map for the final environmental impact statement (FEIS) (2000) for the Medicine Bow/Routt National Forest/Thunder Basin National Grassland, available from the Douglas Ranger District. TBNG Land and Resource Management Plan (LRMP) Goals and Objectives, Standards, and Guidelines applicable to the Mackey Road Relocation project for each Geographic Area are presented in Appendix 1 of this document.

Desired Conditions

The desired condition on the TBNG is to allow continued, uninterrupted public access to NFS lands and surrounding land in the project area while allowing Peabody Power River Mining, LLC (PPRM) to fully develop its existing coal leases at the nearby North Antelope Rochelle Mine (NARM). Relocation of the Mackey County Road (CR69) and Temporary Reno Road (CR83) will accomplish both of these conditions.

1.1.1 Hilight Bill Geographic Area

The Hilight Bill Geographic Area encompasses approximately 100,780 acres of NFS land in the southwestern portion of the TBNG. This geographic area is located roughly parallel to Wyoming State Highway 59 from Bill to Wright, Wyoming. Fairly level plains with slopes of less than 15% characterize the topography of the area. Elevation ranges between 4,700 feet to 5,300 feet above sea level. The primary drainages in the geographic area are the headwaters of Antelope Creek (including the Bates, Spring, and Porcupine creek tributaries), the Dry Fork of the Cheyenne River, and Dry Creek. The dominant vegetation includes big sagebrush (*Artemisia tridentata*), western wheatgrass (*Pascopyrum smithii*), green needlegrass (*Stipa viridula*), and blue grama (*Bouteloua gracilis*).

Desired Conditions

Minerals exploration and development, and livestock grazing will be significant management activities in this geographic area. In some areas, restrictions on public use may be applied to ensure public safety and to avoid unreasonable interference with mineral operations. More

mineral developments and a moderate number of facilities such as coal mines, railroads, oil and gas wells, and pipelines will be present and will often dominate the landscape in this geographical area. Facilities and landscape modifications will be visible, but reasonably mitigated to blend with natural features. Higher fence densities also may occur. In those areas where mining is emphasized, reclamation activities will restore the area to a reasonable level of its pre-mining condition and to blend in with adjacent undisturbed areas.

In areas with other management emphases, existing vegetative diversity and structural conditions will be maintained and enhanced. This area will have a healthy and diverse mix of grasses, including the following species: western wheatgrass, needle-and-thread grass (*Hesperostipa comata*), green needlegrass, little bluestem (*Schizachyrium scoparium*), blue grama, and prairie junegrass (*Koeleria macrantha*).

The streams and riparian areas will be in proper functioning condition or moving towards proper functioning condition. Riparian areas and woody draws will be managed to maintain or enhance different age classes of herbaceous plants, shrubs, and trees. Desired riparian species include sedges, rushes, snowberry (*Symphoricarpos occidentalis*), wild rose (*Rosa* spp.), willow (*Salix* spp.), and cottonwood (*Populus* spp.), as well as other woody plants. Soils in this geographic area will have high infiltration rates and low soil compaction, resulting in minimal overland flow events.

1.1.2 Broken Hills Geographic Area

The Broken Hills Geographic Area includes about 157,440 acres of NFS lands in east-central Wyoming. It consists of the Rochelle Hills, Red Hills, Cow Creek Buttes, and the Downs area southeast of Bill, Wyoming. The topography of the area is characterized by rolling hills to steep escarpments. Elevation ranges from about 4,500 feet above sea level in the Downs area to about 5,200 feet in the Rochelle Hills. The primary drainages in this geographic area are Black Thunder Creek and its tributaries Little Thunder and HA Creeks, the main stem of Dry Creek and its tributaries Bobcat, Deer, and Little Rat Creeks, the Dry Fork of the Cheyenne River, and tributaries to Antelope Creek. The dominant vegetation includes Wyoming big sagebrush (*Artemisia tridentata wyomingensis*), needle-and-thread grass, blue grama grass, western wheatgrass, and ponderosa pine (*Pinus ponderosa*).

Approximately 1.6 non-contiguous miles of the Mackey Road Relocation construction corridor will cross NFS lands in the Broken Hills Geographic Area; 1.2 miles along the central portion of the route and 0.4 mile near its southern extent.

Desired Conditions

The desired condition for the overall geographic area is an open, scenic landscape with little evidence of human activity or influence. Mineral development and facilities will be present, but will be visually subordinate to the landscape in the general area. Natural outbreaks of native insects and diseases will be allowed to proceed without intervention unless a substantial threat to high-value resources exists. This area will have a healthy and diverse mix of grasses such as

western wheatgrass, needle-and-thread grass, green needlegrass, little bluestem, blue grama, and prairie junegrass. Habitat suitability and effectiveness will be maintained for key wildlife species. Stream, riparian, and soil conditions will be the same as those described for the Hilight Bill Geographic Area.

Primitive conditions with minimal facility development will be emphasized. Mineral Developments, such as oil and gas wells and pipelines, will be present but visually subordinate to the landscape in the mid and background. Pastures will be large.

1.2 Management Area Direction

Management Areas are defined as parts of the grassland that are managed for a particular emphasis or theme. Each Management Area has a prescription that outlines the Theme, Desired Conditions, and Standards and Guidelines that apply to it (in addition to the Grassland-wide Standards and Guidelines). Prescriptions have been broken into eight major categories that range from least evidence of disturbance to most evidence of disturbance.

In the Hilight Bill Geographic Area, the proposed Mackey Road relocation falls within the Mineral Production and Development Management Area (8.4). In the Broken Hills Geographic Area, the proposed project is within the General Forest and Rangelands: Range Vegetation Emphasis Management Area (5.12).

1.2.1 Management Area 8.4-Mineral Production and Development

Desired Conditions

Management Area 8.4 is managed for solid mineral operations. Mineral operations of all types are emphasized to effectively and efficiently remove available commercial mineral resources, concurrent with other ongoing resource uses and activities. Operations include development and production of solid minerals such as coal, bentonite, uranium, and hard rock that may involve open-pit mines, stock-piled overburden and top soil, and various ancillary facilities. Facilities and landscape modifications are visible but are reasonably mitigated to blend and harmonize with natural features. Reclamation activities restore the area to a reasonable level of its pre-mining condition. Grazing will occur, except on areas actively being mined; limited grazing also occurs once reclamation is sufficiently established and in the process of bond release.

Restrictions on public use occur to ensure public safety and to avoid unreasonable interference with mineral operations. Visitors can experience frequent encounters with people, heavy equipment, and noise.

1.2.2 Management Area 5.12-General Forest and Rangelands: Range Vegetation Emphasis

Desired Conditions

This Management Area is managed primarily for the sustainability of physical, biological, and scenic values associated with woody vegetation and open grassland. Mineral development and facilities will be present, but will be visually subordinate to the landscape in the general area. Management emphasis targets a balance of resource uses and opportunities, such as livestock grazing, wildlife habitat, dispersed recreation, minerals management, and timber harvest, among others. Though some areas are forested, they usually do not produce commercial wood fiber because of poor site potential.

Recreation facilities may be present. Range and other management activities are coordinated with recreation so they do not conflict with the managed use season. Signs of motorized travel, hunting, hiking, timber harvest, mining and livestock grazing may be evident. Recreational use typically is moderate from spring through fall, with increased use during hunting seasons.

1.3 Purpose of and Need for Action

The U.S. Forest Service (USFS) has identified a *need* for authorizing PPRM to conduct the activities associated with the relocation of segments of Campbell County's Mackey Road and the Temporary Reno Road to allow NARM to fully develop existing federal coal leases WYW-179011, WYW-0321779, WYW-172413, WYW-172414, and WYW-151134, subject to the Mineral Leasing Act. The existing condition is that portions of these two roads overlie mineable coal within NARM's existing federal coal lease boundary. Full development of the federal coal leasing obligation will require that coal lying beneath those road segments be mined. The desired condition is to mine the coal beneath the roads, yet maintain public travel services provided by the roads.

The *purpose* of this action is to relocate those segments of the Mackey and Temporary Reno roads outside the area to be mined in advance of mining and turn the relocated route over to Campbell County jurisdiction so that the underlying coal can be mined and public road services remain uninterrupted.

1.4 Proposed Action

The USFS proposes to authorize PPRM to relocate portions of the Mackey Road and Temporary Reno Road on NFS lands. After construction is complete, the USFS proposes to authorize an easement to Campbell County for use and maintenance of the new route as a county road. The new county road segment will maintain public access to private, state, and NFS lands east of projected mine activities. A brief summary of the Proposed Action is provided below. The full project description is provided in Section 2.1.2.

The proposal includes construction and reconstruction of approximately 8.7 miles of county road constituting a new route for the Mackey Road. These activities will affect approximately 7.1 miles on NFS lands in Township (T) 42 North (N), Range (R) 69 West (W), Sections 6, 7, 8, 17, 21, 28, and 33; and T43N, R69W, Sections 29-31. Approximately 5.85 miles of those affected NFS lands will entail new road construction; the remaining 1.25 miles will involve reconstruction of the existing NFS Road #968 - School Creek Road. Once the project is complete, Campbell County will require the USFS and all other surface owners within the final right-of-way to dedicate a 100-foot wide (50 feet either side of center) easement to the county. The total impacted acreage on NFS lands associated with this project is projected to be approximately 292.7 short-term acres (i.e., during construction) and 85.7 long-term acres (new infrastructure and post-construction maintenance within the easement to be transferred to the county). The design specifications for the new road will conform to current county road standards. Campbell County will maintain the road after the easement is complete.

Upon completion of the new road, approximately 6.1 miles of the existing Mackey Road within the NARM State of Wyoming, Permit to Mine #569 boundary will be vacated. Approximately 2.2 miles of the Temporary Reno Road (8.3 total miles) also will be vacated where it overlaps the current NARM coal lease and/or permit area. Most vacated road segments will be mined through and subsequently reclaimed in accordance with conditions specified in NARM's state mining permit.

1.5 Decision Framework

Through the environmental analysis process, the Forest Supervisor will review the alternatives analyzed in this FEIS, and then determine whether or not and, if so, where and under what conditions, the proposed activities would be authorized.

1.6 Authorities and Regulations

The following statutory authorities and regulations govern the issuance and administration of special-use authorizations on NFS lands that apply directly to the lands affected by the proposed authorization for the Mackey Road Relocation project.

Title V, Federal Land Policy and Management Act of October 21, 1976, (43 U.S.C. 1761-1771). Title V of the Federal Land Policy and Management Act (FLPMA) authorized the Secretary of Agriculture to issue permits, leases, or easements to occupy, use, or traverse NFS lands. FLPMA directs the United States to receive fair market value unless otherwise provided for by statute and provides for reimbursement of administrative costs in addition to the collection of land use fees (43 U.S.C. 1764(g)).

Title 36, Code of Federal Regulations, Part 251, Subpart B. This subpart provides direction for special uses management on NFS lands, including guidance pertaining to the special-use application process; terms and conditions of use; rental fees; fee waivers; termination, revocation, suspension, and modification of existing authorizations; and permit administration.

Title 36, Code of Federal Regulations, Part 251, Subpart C. This subpart provides a process for appeals of decision related to administration of special use authorizations on NFS lands.

Bankhead-Jones Farm Tenant Act of July 22, 1937, as amended (7 U.S.C. 1010-1012). Title III of this act directs and authorizes the Secretary of Agriculture to develop programs of land conservation and use to protect, improve, develop, and administer the land acquired and to construct structures thereon needed to adapt the land to beneficial use. Under the act, the Department of Agriculture may issue leases, licenses, permits, term permits, or easements for most uses, except rights-of-ways.

Mining and Minerals Policy Act of 1970. This Act declared it would be the continuing policy of the federal government and in the national interest to foster and encourage private enterprise in the development of economically sound and stable domestic mining industries, and the orderly and economic development of domestic mineral resources.

Mineral Leasing Act of 1920, as Amended by the Federal Coal Leasing Amendments Act of 1975. This Act, as amended, authorizes the federal agencies to lease coal reserves and prescribe conditions for protection of non-coal resources. It requires the Bureau of Land Management (BLM) to secure consent from the surface management agency prior to leasing federal coal lands.

National Historic Preservation Act. This decision complies with the provisions of this Act and the American Indian Religious Freedom Act. Native American interests were consulted during this project.

Endangered Species Act. Compliance with this Act is addressed in this document. A Biological Assessment for the North and South Porcupine Lease By Application tracts was included in Appendix G of the Final Wright Area Coal Lease Applications EIS. The U.S. Fish and Wildlife Service (USFWS) reviewed the Wright Area Coal Lease Application EIS, including the Biological Assessment, and provided comment to the BLM on its content in a memorandum letter dated December 15, 2010.

National Environmental Policy Act (NEPA) of 1969. The documentation for this project fully complies with this Act.

1.7 Public Involvement

The project has been identified in the Schedule of Proposed Actions for the Medicine Bow-Routt National Forests since the third quarter (July through September) of 2009. The legal notice for public scoping and notice of comment was posted on May 1, 2011. The legal notice requested public comment on the proposal within 30 days after publication in the Laramie Boomerang newspaper. In addition, as part of the public involvement process, the agency sent a scoping letter to specific interested publics (permittees, federal, state, county, and local government agencies, and other persons who have expressed an interest in natural resource management on the TBNG) on April 18, 2011. Four public comment letters were received as part of the initial public scoping process. Those comments and USFS responses were included in the draft EIS.

After consideration of the public comments, as well as internal comments and issues, it was determined by the Interdisciplinary Team with approval by the Responsible Official to proceed with the project as an environmental impact statement. Therefore, on December 16, 2011 the Notice of Intent was published in the *Federal Register*. The draft EIS was released to the public on May 24, 2013, which opened a 45-day public comment period. A summary of the public comments received on the draft EIS and the disposition of those comments is provided in Appendix 2.

The project proposal has been reviewed by the Campbell County Public Works Department and the Campbell County Road and Bridge Department. The proposal also was presented to the Campbell County Board of Commissioners and the general public at a regular meeting of the Board in November 2010. At that public meeting, the Board of Commissioners was asked to initiate the procedure for vacation and relocation. On September 7, 2011, the Campbell County Board of Commissioners adopted a resolution initiating the procedure to vacate and/or relocate portions of the Mackey Road and Temporary Reno Road. At that meeting, the Commissioners also appointed viewers to examine the expediency of the Proposed Action. On December 19, 2011, the viewers submitted a report to the Board of County Commissioners that recommended proceeding with the project provided certain conditions were met.

Public notice of Campbell County's decision to initiate procedures to relocate and vacate the sections of county road in question was published in the Gillette News-Record and given by certified mail to all those owning lands or claiming any interest in the lands to be affected, along with an invitation for all those with claims for damages or objections to the project to submit them in writing to the county clerk by a certain date. Written objections were submitted with the specified timeline, and a public hearing was held on May 1, 2012. At that hearing, the Board of County Commissioners for Campbell County determined that the project was deemed to be in the public interest (Road Resolution No. 1744). Notice of commencement of construction activities will be given to land owners, surface permittees, and other interest holders or parties who regularly occupy the lands which are the subject of this construction project.

1.8 Issues

The USFS separated issues into two groups: key and non-key issues. Key issues were defined as those directly or indirectly caused by implementing the Proposed Action. Non-key issues are defined as those: 1) outside the scope of the Proposed Action; 2) already decided by law, regulation, the TBNG LRMP, or other higher level decision; 3) irrelevant to the decision to be made; or 4) conjectural and not supported by scientific or factual evidence. The Council on Environmental Quality (CEQ) NEPA regulations require this delineation in Section 1501.7: "...identify and eliminate from detailed study the issues which are not key or which have been covered by prior environmental review (Section 1506.3)... ." A list of non-key issues and reasons regarding their categorization as non-key can be found at the Douglas Ranger District in the project record. The key issues identified during scoping or by the USFS Interdisciplinary Team regarding the need for an EIS rather than an environmental assessment are listed below:

- Long-term (i.e., irretrievable/irreplaceable) habitat impacts;
- Cumulative impacts on air quality and/or climate change;

- Potential effects on various wildlife populations, habitats, and hunting;
- Use of wildlife-friendly fencing;
- Potential effects of increased motorized public access to the TBNG;
- Use of best management practices for erosion control during construction and post-construction reclamation; and
- Control of invasive plant species (terrestrial and aquatic) during and post-construction.

As noted, Appendix 2 provides a complete list of key public comments on the draft EIS for this project and USFS responses to those comments.

CHAPTER 2. ALTERNATIVES, INCLUDING THE PROPOSED ACTION

This chapter describes and compares the alternatives considered for the proposed Mackey Road Relocation project on NFS lands in the Hilight Bill and Broken Hills Geographic Areas of the TBNG in northeast Wyoming. The alternatives also are presented in Table 2-1, defining the differences between each alternative, and providing a clear basis for choice among options by the decision-maker and the public.

2.1 Alternatives Considered in Detail

NEPA requires the agency to “Study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources as provided by section 102(2)(E) of the Act” (40 Code of Federal Regulations [CFR] 1501.2(c)). It is required to develop reasonable alternatives to the proposed action that should still fulfill the purpose and need and address unresolved conflicts related to the proposed action.

2.1.1 Alternative 1: No Action

Alternative 1, the No Action alternative, was considered and evaluated. The No Action alternative enables the decision-maker (USFS) to compare the magnitude of environmental effects among alternatives to a baseline of the existing management conditions. Consideration of the No Action alternative is required by 40 CFR 1502.14 (d). This alternative will preclude development of the proposal as described in the Proposed Action (Section 2.1.2).

NARM is currently authorized to recover coal under NFS lands within its current coal lease and state permit boundaries under an existing Special Use Authorization. Under the No Action alternative for this FEIS, the existing alignments of the Mackey County Road and the directly adjoining segment of the Temporary Reno Road will be retained, and no new road construction will occur. Coal mining associated with NARM will continue on private, state, and federal mineral estates west of the proposed project area, but mining will not occur under the approximately 6.1 miles of the existing Mackey County Road and 2.2 miles of the existing Temporary Reno Road that will otherwise be vacated and mined-through as described under the Proposed Action. The lack of an alternate route outside of active mine operations will pose a safety hazard to the general public traveling through the NARM permit area.

Other existing operations and infrastructure associated with oil and gas, utility and communication lines, livestock grazing, and other previously permitted activities within the project area also will be continued under the No Action alternative. An incremental loss of livestock and wildlife habitat will occur in the general vicinity as mining continues west of the project area, with some grazing permits and wildlife species affected until reclaimed habitats are established.

2.1.2 Alternative 2: Proposed Action

The USFS proposes to authorize PPRM to relocate portions of the Mackey Road and Temporary Reno Road onto NFS lands. The Proposed Action will occur outside NARM's current Wyoming Department of Environmental Quality (WDEQ) approved Permit to Mine (No. 569 T-6) and current coal lease boundary (Appendix 3, Exhibit A). Due to the location on NFS lands, the project is subject to USFS authorization for right-of-entry for access to construct the road. After construction is complete, the USFS proposes to authorize an easement to Campbell County for use and maintenance of the new route as a county road. The new county road segment will maintain public access to private, state, and NFS lands east of projected mine activities.

The proposal includes construction and reconstruction of approximately 8.7 miles of county road constituting a new route for the Mackey Road. These activities will affect approximately 7.1 miles on NFS lands in T42N, R69W, Sections 6, 7, 8, 17, 21, 28, and 33; and T43N, R69W, Sections 29-31. Approximately 5.85 miles of those affected NFS lands will entail new road construction; the remaining 1.25 miles will involve reconstruction of the existing NFS Road #968 - School Creek Road. Once the project is complete, Campbell County will require the USFS to dedicate a 100-foot wide (50 feet either side of center) right-of-way easement to the county. The total impacted acreage on NFS lands associated with this project is projected to be approximately 292.7 short-term acres (i.e., during construction) and 85.7 long-term acres (new infrastructure and post-construction maintenance within the easement to be transferred to the county). The design specifications for the new road will conform to current county road standards. Campbell County will maintain the road after the easement is complete.

Upon completion of the new road, approximately 6.1 miles of the existing Mackey Road within the NARM permit boundary will be vacated. Approximately 2.2 miles of the Temporary Reno Road (8.3 total miles) also will be vacated where it overlaps the current NARM coal lease and/or permit area. Most vacated road segments will be mined through and subsequently reclaimed in accordance with conditions specified in NARM's state mining permit.

The proposed road will be constructed as an all-weather, gravel surface road with two travel lanes measuring 14 feet wide each. The road will be constructed with a minimum 8-inch-thick base course/running surface of compacted, crushed gravel or gravel/milled asphalt mix (2 inches maximum crushed size) placed on top of a compacted, engineered sub-grade fill or cut. A geo-grid-type stabilization material may be used under the base course or within the cut/fill zone in areas where stability of the sub-base might be of concern. The road running surface will be sloped at 3% grade away from the center line. Road shoulders and outslopes will not exceed a 4:1 grade from the running surface outward. Slopes will be designed to minimize erosion potential by employing a combination of currently accepted standard practices such as slope angle reduction, re-application of topsoil, re-vegetation with appropriate seed mixes designed to create the best cover, and, possibly, the use of mechanical runoff control features such as contour ditches, drop structures, etc. All ditches and drainage structures will be designed and constructed to provide satisfactory control of surface drainage. Slope angle in ditches will be reduced to the extent possible to control drainage velocity and will probably need to be supplemented with

mechanical control devices such as rip-rap (or other rock armoring), geo-web filled with rock or concrete, drainage culvert armoring and slope paving, check dams, and so on.

Approximately 0.5 mile of the entire 8.73-mile road length will involve major cut/fill construction. Cut and fill slopes will be constructed to minimize erosion. Engineered drainage structures consisting of multiple corrugated metal pipe or concrete box culverts will be installed to maintain post-construction habitat connectivity and prevent down-cutting and head-cutting where the road will cross Little Thunder Creek and School Creek.

A WDEQ Stormwater Pollution Prevention Plan permit will be obtained by the construction contractor and will remain in force until the construction area has been adequately re-vegetated and the slopes and ditches fully stabilized. In addition, the prime contractor will be required to provide a 1 year warranty to Campbell County against any construction deficiencies.

All construction disturbance on NFS lands will occur within a 300-foot to 700-foot wide corridor (Appendix 3, Exhibit B). Any yard area needed for temporary storage of geo-grid, culvert pipe, and accessories will be located within the construction corridor or on privately-owned or leased surface. Construction and maintenance vehicles will use existing highways, county roads, dirt roads, and the proposed construction right-of-way corridor to access and travel within the project area.

Surface disturbance within the construction corridor will include: overland travel of vehicles and equipment; topsoil removal, stockpiling, and replacement; cut/fill activities; road base placement and compaction; gravel surfacing; fencing; and reclamation of ancillary areas. Access to sources of construction water may require surface pipelines and pumps to be delivered via light vehicles and laid across native ground surface on public lands (Appendix 3, Exhibit B). Such access and activities will be limited to existing roads or the use of surface pipelines carefully installed across public land to avoid excessive disturbance of native ground surfaces.

Dust control practices (application of water) will be used during construction to minimize dust emissions. The use of durable gravel surfacing will minimize fugitive dust from the completed road and comply with Campbell County Public Works Department construction requirements. Slope erosion associated with the new road construction will be controlled as described above. All construction and maintenance activities will cease when soils or road surfaces become saturated to the extent that the construction equipment is unable to stay within the right-of-way corridor/workspace and/or when activities could cause irreparable harm to other access roads or undisturbed soils.

Upon completion of the project, all road cuts, fill slopes, topsoil stockpiles, and other areas disturbed outside the permanent right-of-way as a result of this project will be reclaimed using appropriate techniques and seed mixes. Fencing and fence gates along the new right-of-way removed during construction will be designed and replaced based on input from grazing permittees, logical pasture delineations, and water availability.

2.2 Alternatives Considered but Eliminated from Detailed Study

Federal agencies are required by NEPA to rigorously explore and objectively evaluate all reasonable alternatives that successfully meet the purpose and need, and then briefly discuss the reasons for eliminating any alternatives that were not developed in detail (40 CFR 1502.14[a]). PPRM considered 19 route options during an internal review process prior to submitting the proposed alignment (i.e., Proposed Action) to the USFS. Eighteen of those 19 options were rejected from further consideration due to one or more of the following reasons:

- a) They would result in a greater impact on NFS lands than the Proposed Action or No Action alternative;
- b) They would result in greater impacts on wildlife and/or cultural site locations than the Proposed Action or No Action alternative;
- c) Public safety issues were identified that were either not present or were diminished by the Proposed Action or No Action alternative, including: additional, sharper, and/or longer horizontal or vertical curves; steeper grades; and an additional 90 degree intersection;
- d) Additional road lengths and surfacing would be required than under the Proposed Action, resulting in more surface disturbance and a greater number of affected landowners and/or land management agencies, including impacts on pasture integrity for landowners and members of the local Thunder Basin Grazing Association;
- e) Alternate routes would provide a less direct route for public traffic than the Proposed Action or No Action alternative;
- f) The proposed alignment had to meet requirements set forth by the Campbell County Commission, as the ultimate entity responsible for operation and maintenance of the relocated road (i.e., upon completion, the county will require the dedication of an easement for the new right-of-way from each surface owner, including the USFS);
- g) No viable alignments are available on previously mined lands because no such lands are present in the eastern portion of the nearest mine; i.e., the nearest mine lands are still subject to surface disturbance;
- h) Any viable alignments that may have been available on previously mined lands also would have affected NFS lands; and/or
- i) Higher construction and maintenance costs would be necessary than those associated with the Proposed Action and No Action alternative.

As stated, the proposed alignment ultimately had to meet requirements set forth by the Campbell County Commission, as the county will be the entity responsible for operation and maintenance of the new road upon completion. The Campbell County Commission's input, and the above reasons for not pursuing the 18 eliminated options, were provided to the USFS to assist them in developing reasonable alternatives to the Proposed Action.

In addition to the internal assessment conducted by PPRM prior to submittal of the project for USFS review, the agency itself considered the option of allowing the affected road segments to be mined through without providing an alternate route. That option was rejected because it would have resulted in the loss of public access to federal, state, and private lands currently served by the county roads. Based on these combined factors, the USFS determined that only

two viable options exist for the Mackey Road Relocation project, as described in Section 2.1: the Proposed Action and No Action alternative.

2.3 Comparison of Alternatives

This section provides a summary of the effects of implementing each alternative analyzed in the FEIS. Information in Table 2-1 focuses on the activities and effects documented in Chapter 3, where different levels of effects or outputs can be distinguished quantitatively or qualitatively among alternatives.

2.4 Monitoring

This section explains monitoring as it relates to implementation of the action alternative. Although monitoring information is usually included in the Record of Decision (ROD), it is worthwhile for the reader to have an understanding that the bulk of the on-the-ground work occurs once the final EIS is completed. Monitoring can determine whether the project-level decision is being implemented as planned (implementation monitoring) and, if so, whether the objectives identified are being achieved in a timely manner (effectiveness monitoring). If monitoring indicates that desired conditions are not being met, other pre-determined management options included in the project decision may be selected for implementation. If monitoring indicates that management is meeting standards, or is making measurable progress toward the desired conditions in an acceptable timeframe, the initial management options may continue (Forest Service Handbook [FSH] 2209.13, Section 95). The USFS invites participation from other interested parties where feasible. Implementation and focused effectiveness monitoring are critical to determine if or when adaptive management changes should be made, and to guide the direction that those changes take.

Monitoring for this project will include implementation monitoring and effectiveness monitoring for the TBNG LRMP Goals, Objectives, Standards, and Guidelines, as outlined in Appendix 1, and for any mitigation measures that are determined necessary in the ROD. The following additional resource-specific monitoring requirements also have been identified for the proposed project:

- The discovery of any and all antiquities or other objects of historic or scientific interest including, but not limited to, historic or prehistoric ruins, or artifacts as the result of operations under this plan shall immediately be brought to the attention of the Forest Supervisor. The permittee shall cease operations until authorized to proceed by the Forest Supervisor.
- The discovery of any and all fossils as the result of operations associated with the proposed project shall immediately be brought to the attention of the Forest Supervisor. The permittee shall cease operations until authorized to proceed by the Forest Supervisor.

Table 2-2. Disturbance summary for the Mackey Road Relocation project alternatives evaluated in the FEIS.

Features	Alternative 1 No Action	Alternative 2 Proposed Action
Miles of new road corridor	0.0	8.73
Miles of new road corridor on NFS lands	0.0	7.07
New construction corridor acreage ²	0.0	358.29
New construction corridor acreage on NFS lands ²	0.0	292.68
Completed road corridor acreage	0.0	105.74
Completed road corridor acreage on NFS lands ³	0.0	85.67
Cultural Resources	No Effect	No Effect due to avoidance or mitigation
Paleontological Resources	No Effect	No Effect
Terrestrial Wildlife - T&E	No Effect	No Effect
Terrestrial Wildlife – Candidate	No Effect	May adversely affect individuals due to required mitigation*
Terrestrial Wildlife - Sensitive	May adversely affect individuals*	May adversely affect individuals*
Terrestrial Wildlife - MIS	Populations remain viable grassland wide	Populations remain viable grassland wide with required mitigation
Terrestrial Wildlife - Other	May adversely affect individuals*	May adversely affect individuals*
Plant Species - T&E	No Effect	No Effect
Plant Species - Sensitive	Not likely to cause a trend towards federal listing	Not likely to cause a trend towards federal listing
Plant Species – Local Concern	Assuming presence, no loss of viability	Assuming presence, no loss of viability
Social and Economics	Could lose 300 jobs if mine cannot continue operations	No jobs lost
Estimated Federal and State Coal Lease Revenue	\$586,000,000 lost	\$586,000,000 gained

* May adversely impact individuals but is not likely to cause a trend to federal listing or loss of viability within the planning area.

¹ Acreages are calculated by multiplying the corridor length by its width (all in feet) and dividing that outcome by 43,560 feet² per acre.

² State land: 4.06 acres disturbance in completed road corridor.
Private land: 16.0 acres disturbance in completed road corridor.
Total Acres for completed road corridor: 85.67+4.06+16.0=105.7 total acres.

- To help protect federally listed species, PPRM or the road construction operator will notify the Forest Supervisor should sightings of a federally listed species be discovered during construction or operation of the project. Those reports will occur regardless of whether the species was evaluated in this EIS.
- Annual monitoring of known wildlife features of concern (e.g., sage-grouse [*Centrocercus urophasianus*] leks, raptor nests, etc.) within the area may be recommended to document occupancy.

2.5 Required Mitigation

The following mitigation measures will be required under the Proposed Action. During road construction, PPRM will be required to mitigate on-site impacts through one or more of the following:

- control of noxious weeds and invasive species will be performed by the road contractor during construction of the road; after the construction is complete and the road is dedicated, the control of noxious weeds will be the responsibility of Campbell County;
- slope erosion and runoff will be controlled during construction as described under the Proposed Action or by other appropriate best management practices, where necessary;
- common dust control practices (application of water) will be utilized to minimize impacts to air quality and visibility -- the company may choose to continue dust suppression for some time post-construction as a good faith effort;
- road contractor will adhere to timing restrictions (i.e., USFS Standards) designed to protect active wildlife features (i.e., grouse leks and raptor nests); and
- reclamation of newly disturbed areas beyond the final right-of-way will occur upon completion of construction, and will be accomplished using appropriate methods and seed mixes.

PPRM also will be required to implement off-site mitigation measures in appropriate sage-grouse habitat elsewhere on the TBNG before, during, or after construction. Such measures could include, but are not limited to:

- cheatgrass treatments;
- additional weed control outside the project area;
- conifer removal in sagebrush habitats;
- removal of silver sagebrush (*Artemisia cana*) in drainages through mowing;
- water development or enhancements;

- windmill removals and replacement with solar pumps;
- other measures identified collaboratively by PPRM and the USFS as benefitting sage-grouse.

CHAPTER 3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

Chapter 3 summarizes the existing physical, biological, social, and economic environments of the project area and the effects of implementing each alternative on that environment. It also presents the scientific and analytical basis for the comparison of alternatives presented in the alternatives chapter.

3.1 Affected Environment

The Mackey Road and Temporary Reno Road are two main gravel county roads in southern Campbell County, Wyoming. These roads provide access to NFS lands, state lands, and private lands located between the paved Antelope and Edwards roads and south of Wyoming Highway 450. Both roads currently overlie existing coal leases being mined by NARM.

The proposed project occurs within the administrative boundary of the TBNG, Douglas Ranger District. This area is comprised of approximately 572,000 acres of NFS lands, intermingled with over 1 million acres of private and state lands. The TBNG is within the Powder River Basin (PRB), which encompasses northeast Wyoming and southeast Montana. The PRB is a structural basin (and distinct drainage basin) situated between the Bighorn Mountains to the west, the Laramie Mountains to the south and west, and the Black Hills and Hartville Uplift to the east; it extends into open country to the north in southeastern Montana. Elevations within the PRB range from approximately 6,000 feet along the Rochelle Hills Escarpment in the western portion of the basin to about 3,000 feet along the eastern border near the Black Hills.

The Proposed Action is mostly within the Hilight Bill Geographic Area. Minerals exploration and development and livestock grazing are, and will be, significant management activities in this geographic area. Mineral developments and facilities such as coal mines, railroads, oil and gas wells, and pipelines are, and will be, present and will often dominate the landscape. Facilities and landscape modifications will be visible, but reasonably mitigated to blend with natural features. In areas where mining is emphasized, reclamation activities will restore the area to a reasonable level of its pre-mining condition and to blend in with adjacent undisturbed areas. In some areas, restrictions on public use may be necessary to ensure public safety and to avoid unreasonable interference with mineral operations. More development and a moderate number of facilities will occur in this geographic area compared to other regions of the TBNG. Higher fence densities also may occur.

Approximately 1.6 non-contiguous miles of the construction corridor will cross NFS lands in the Broken Hills Geographic Area. The Management Area (5.12) for this portion of the geographical area is managed primarily for the sustainability of physical, biological, and scenic values associated with woody vegetation and open grassland. Management emphasis targets a balance of resource uses and opportunities, such as livestock grazing, wildlife habitat, dispersed recreation, minerals management, and timber harvest, among others. Mineral development and facilities will be present, but will be visually subordinate to the landscape in the general area.

Signs of motorized travel, hunting, hiking, timber harvest, mining, and livestock grazing may be evident in some areas.

Visual Resource Management objectives are to design and implement management activities to blend with the natural landscape. The Visual Quality Objective for the area is that of modification, a classification that allows management activities to visually dominate the original characteristic landscape. Facilities and landscape modifications are visible, but reasonably mitigated to blend with natural features to the extent possible.

The Scenic Integrity Objective for the project area is semi-primitive motorized. Livestock grazing is the dominant land use. Recreational use, primarily big game hunting, also occurs. Little camping, hiking, or mountain biking have been observed as occur elsewhere on the TBNG west of Highway 59.

The requested construction corridor will be approximately 300 feet wide along the majority of the route; the corridor will be 700 feet wide for approximately 4,500 feet of mixed surface ownership near the northern end of the project area. This will result in approximately 292.7 acres of short-term surface disturbance on NFS lands during construction. The completed road will have a right-of-way width of approximately 100 feet. Upon completion and acceptance by Campbell County, the USFS is expected to grant a permanent easement to Campbell County for the entire 100 foot corridor. Consequently, long-term post-construction impacts on NFS lands will be approximately 85.7 acres.

The proposed right-of-way is dominated by Big Sagebrush Shrubland, Upland Grassland, Ponderosa Pine Woodland, and Scoria (a.k.a. clinker) Grassland vegetation communities. The Big Sagebrush Shrubland vegetation community is composed of big sagebrush, needle-and-thread, western wheatgrass, prairie junegrass, and cheatgrass (*Bromus tectorum*). The Upland Grassland vegetation community has a similar plant species composition; however, big sagebrush cover is absent or at least less than 20%. The Scoria Grassland vegetation community is dominated by cheatgrass, broom snakeweed (*Gutierrezia sarothrae*), needle-and-thread, threadleaf sedge (*Carex filifolia*), blue grama, and prairie junegrass. Portions of the Scoria Grassland and the entire Ponderosa Pine Woodland vegetation communities have ponderosa pine and Rocky Mountain juniper (*Juniperus scopulorum*) present. The understory in the Ponderosa Pine Woodland community is dominated by western wheatgrass, prairie junegrass, needle-and-thread, threadleaf sedge, and blue grama.

Topography varies from rolling hills in the Upland Grassland and Big Sagebrush Shrubland vegetation communities to steep hills in the Scoria Grassland and Ponderosa Pine Woodland vegetation communities. All drainages are semi-perennial (due to perennial springs), intermittent, or ephemeral; no true perennial streams are present in the project area.

Land uses in the general vicinity include surface coal mining (west of the analysis area), livestock grazing (primarily sheep), oil and gas exploration and development (conventional and coal bed natural gas [CBNG]), and hunting and other forms of recreation. Numerous forms of equipment (medium and light duty), energy infrastructure (wells, pipelines, and power lines), and roads are scattered throughout the entire analysis area.

No current threatened or endangered (T&E) species (plants or animals) occur within the project area, nor are any T&E vertebrate species scheduled for release there or on immediately adjacent lands (i.e., within the 1.0-mile analysis area). Data from NARM's voluntary, long-term (2001-2012) monitoring of radio-collared birds demonstrate that the greater sage-grouse (candidate species, hereafter, sage-grouse) does use a portion of the 4.0-mile sage-grouse analysis area with some regularity.

The upland habitats within the project area support a wide variety of common mammalian species including the pronghorn (*Antilocapra americana*), mule deer (*Odocoileus hemionus*), elk (*cervus elaphus*), coyote (*Canis latrans*), black-tailed prairie dog (*Cynomys ludovicianus*), and various lagomorph (rabbits and hares) and rodent species. White-tailed deer (*Odocoileus virginianus*) and swift fox (*Vulpes velox*) could occur in riparian and grassland habitats, respectively, but neither species has been recorded in the analysis area during regular aerial or ground surveys conducted in many years since at least 1994.

Although suitable habitat is present in some areas, no plains sharp-tailed grouse (*Tympanuchus phasianellus*) have ever been observed during targeted surveys conducted on NFS or surrounding lands either in or near the proposed right-of-way over the years, or as incidental sightings during other wildlife surveys completed in that area during that period. The mountain plover (*Charadrius montanus*) also has never been recorded in the proposed right-of-way; this species was recorded in the general vicinity only once during the last two decades of annual monitoring. Numerous resident and seasonal avian species also occur in and near the project area, including several raptor and passerine species.

All or portions of 14 black-tailed prairie dog colonies have been historically documented in the 1.0-mile analysis area for this project. Six of the 14 colonies had active portions within the analysis area in 2013, for a total of approximately 420 non-contiguous, active acres. Five of the six active colonies were entirely or partially on NFS lands, encompassing approximately 245 non-contiguous acres (58% of total active acreage in analysis area).

No active colonies on NFS lands will be disturbed by the proposed project. Approximately 8.6 acres of one active colony on private surface will be intersected by the proposed construction corridor; that represents approximately 2% of the total active colony acreage in the 1.0-mile analysis area. The final right-of-way will span approximately 2.9 active acres (0.7% of total) in that colony. None of the prairie dog colonies in the project area have been designated for ferret reintroductions (refer to Management Area 3.63-USFS 2002, Grenier 2004).

The construction corridor (project area) crosses two streams: Little Thunder Creek (intermittent) and School Creek (semi-perennial due to perennial springs along its east side) at its northern end in T43N, R69W, Sections 30 and 31, respectively. According to USFS resource specialists, two Region 2 (TBNG) sensitive fish species could potentially occur in those drainages within the Mackey Road Relocation project area: plains minnow (*Hybognathus placitus*) and flathead chub (*Platygobio gracilis*). The northern leopard frog (*Lithobates pipiens*) is the only Region 2 amphibian that could occur; no sensitive reptile species have been identified for this project. Other reptile and amphibian species recorded in the analysis area with any regularity are the prairie rattlesnake (*Crotalus viridis viridis*) and boreal chorus frog (*Pseudacris maculate*), respectively. Impacts on aquatic species will be minimized by the timing (during low flow) of

the proposed disturbance, through the use of appropriate culverts to maintain post-construction habitat connectivity and prevent down-cutting and head-cutting, through implementation of erosion and sedimentation control measures, and through required mitigation for affected U.S. Army Corps of Engineers (USACOE) jurisdictional wetlands. The timing of disturbance also will reduce potential impacts on reptiles, which typically hibernate during winter months.

Region 2 sensitive plant and animal species requiring different habitats, elevations, or other characteristics than those found in the Mackey Road Relocation analysis area were eliminated due to the lack of such features in the project area or the absence of physical disturbance of suitable habitats within the project corridor.

Impacts on the Environment

Three separate types of impacts on the environment are identified: direct, indirect, and cumulative effects. Direct effects are caused by the action and occur at the same time and place. Indirect effects also are caused by the action but occur later in time or are farther removed in distance. Cumulative effects result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions (40 CFR 1508.7).

Cumulative Effects Protocol

Cumulative effects are defined as the “impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions...can result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.7).

All projects listed in the Cumulative Effects section below have been implemented (past and present), are currently being developed (future), or are in progress (present and future). Additional project information can be found in the Medicine Bow-Routt National Forest, Douglas Ranger District Schedule of Proposed Actions (SOPA) at the following website: <http://www.fs.fed.us/nepa/fs-usda-pop.php/?project=34278>.

After the project implementation date is 5 years past, the project will be moved into the “Past” column of the cumulative effects table. Given the life of various projects, some project activities may become permanent features in the cumulative effects table for certain areas. This protocol is aimed at decreasing the length of the cumulative effects section of an environmental document, yet including all of the appropriate information so as to be thorough and forthcoming with the most current data.

Thunder Basin National Grassland Projects

Travel Management. Travel Management for the TBNG. Contact: Misty Hays.

This project covers the entire TBNG. Review and analysis of the roads/trails for designation, include: opening trails/roads; closing trails/roads; converting roads to trails; decommissioning trails/roads; seasonal closures for trails/roads; and constructing trails/roads.

Cheatgrass Management Analysis. States of Colorado and Wyoming, including the following counties in those states: Garfield, Grand, Jackson, Moffat, Rio Blanco, Routt, Albany, Campbell, Carbon, Converse, Crook, Natrona, Niobrara, Platte, and Weston. Contact: Bob Mountain

This proposal will allow the aerial application of the herbicides Plateau and Journey to treat infestations of cheatgrass acres on the Medicine Bow-Routt National Forest and TBNG. This project is in analysis with a projected decision date of May 2012.

Plan Amendment for Prairie Dog Management. T37-48N, R62-73W and T53-55N, R68-71W. Contact: Misty Hays.

The black-footed ferret reintroduction area boundary has been modified. This project adds management tools for controlling prairie dogs that are not currently available, such as lethal and non-lethal, landownership adjustment, and third-party solutions. Prescribed burning is currently being used to develop appropriate habitat for prairie dogs and associated species. Implementation began in March 2010.

Land Management Planning Rule. Contact: Larry Hayden.

The Department of Agriculture proposes to promulgate a new planning rule that will set out the process for development, revision, and amendment of NFS land management plans.

Greater Sage-grouse Plan Amendment. Contact: Misty Hays.

The TBNG is a cooperating agency in the development of a programmatic EIS to incorporate greater sage-grouse conservation measures into land management plans through plan amendment, including the TBNG plan. The Wyoming BLM is the lead agency.

Analysis Area Projects

Given the above protocol, all activities and facilities located in the analysis area for the proposed project are listed in Table 3-1. Descriptions of specific projects are provided below. All USFS projects are listed with contact information. Other agency or non-agency projects do not include contact information.

Table 3-1. Past, present, and future projects in the analysis area for the Mackey Road Relocation project.

PAST ^a	PRESENT ^b	FUTURE ^c
Dispersed recreation	Dispersed recreation	Dispersed recreation
Grazing	Grazing	Grazing
Oil and Gas	Oil and Gas	Oil and Gas
Roads	Roads	Roads
Railroad	Railroad	Railroad
Power Line	Power Line	Power Line
Coal Mine	Coal Mine	Coal Mine
Pipeline	Pipeline	Pipeline

^a Past projects are defined as all actions, on record, that were implemented ≥ 5 years ago.

^b Present projects are defined as all actions, on record, that were implemented ≤ 4 years ago and have completed the appeal period of the NEPA process.

^c Future actions are defined as all actions listed on the Schedule of Proposed Actions for the Douglas Ranger District that have not yet been implemented and are in the development process. The “Future” projects must have gone through internal scoping with District resource specialists.

* Please see the section labeled “Additional CBNG Production Activity.”

Current Projects within the Proposed Project Area:

1. Wright Area Coal Lease by Application (LBA). Minerals. Contact: Amy Ormseth.

Project is located east of Wright, Wyoming. The analysis for this project included the applications for coal leases in the Wright area. The aim of the project was the continuation of coal mining at the Black Thunder and North Antelope Rochelle mines. Analysis was completed in July 2010. Conjectured implementation date was winter 2012.

2. RT Communications, Inc. Keeline to Wright. Special Use. Contact: Geri Proctor.

T43N, R70W (Highways 450, 59, and 387). New fiber optic line will be placed in the right-of-way of Wyoming State Highways 450, 59, and 387. This will occur on 4.13 miles of NFS land. Conjectured implementation date was fall 2011.

3. Antelope Mine Railroad Spur. Minerals. Contact: Amy Ormseth.

T40N, R71W, W $\frac{1}{2}$ SW $\frac{1}{4}$ Section 1; W $\frac{1}{2}$, Section 12; W $\frac{1}{2}$, Section 13; and SESE, Section 14, Converse County, Wyoming. Antelope Coal, LLC has requested an authorization to amend the existing Antelope Mine special use permit to allow expansion of the railroad spur area associated with expansion and increased capacity of the coal loadout facility. Analysis in process.

4. Thunder Basin Coal Company (TBCC)–Scoria Mining. Minerals. Contact: Amy Ormseth.

NFS lands within the analysis area include portions of T43N, R70W, Sections 11-14 and 23-25, Campbell County, Wyoming. The USFS is proposing to authorize a permit to the Thunder Basin Coal Company (TBCC) to allow acquisition of an adequate supply of aggregate construction material (clinker) to support required maintenance and changes in infrastructure necessary for mining activities. Analysis in process.

5. Black Thunder Mine – Topsoil Stockpiles. Minerals. Contact: Amy Ormseth.

T43N, R71W, W½ Section 22 and W½ Section 27, Campbell County, Wyoming. The USFS proposes to authorize TBCC, operator of BTM, right-of-entry access to NFS lands on the TBNG for the purpose of constructing and storing topsoil stockpiles. Analysis in process.

6. North Antelope Rochelle Mine – Dewatering. Minerals. Contact: Amy Ormseth.

T42N, R71W, W½ Section 35 (~ 320 acres); T42N, R71W, N½ N½ Section 25 and N½ NE¼ Section 26 (~ 247 acres), Campbell County, Wyoming. The USFS proposes to authorize Peabody Powder River Mining, LLC, operator of the North Antelope Rochelle Mine, right-of-entry access to NFS lands to conduct exploration drilling and install overburden dewatering wells and associated facilities to facilitate full development of their existing federal coal lease (WYW 150210). Analysis in process.

7. Black Thunder Mine – Installation/Construction of Dewatering Wells and Overstripping Area. Minerals. Contact: Amy Ormseth.

The proposed dewatering wells are located on NFS lands and consist of two areas. The USFS has identified a need to authorize Thunder Basin Coal Company, LLC, operator of the Black Thunder Mine, to construct dewatering wells and conduct topsoil and overburden overstripping activities. Conjectured implementation is August 2013.

Additional CBNG Production Activity on Non-NFS Surface

In addition to the CBNG wells that have been drilled on NFS land within the proposed Mackey Road Relocation project area, CBNG production activities and infrastructure (producing wells and ancillary facilities: roads, above-ground and buried electric lines, buried water lines, and header buildings) also are occurring on non-NFS surface and should be considered in cumulative effects analyses. These wells and facilities are likely to exist through at least 2015. The wells will be eliminated over time either due to a lack of economically viable natural gas supply or to being mined through by the coal mine (for wells near active mines).

In addition to analyses conducted for this Environmental Impact Statement, portions of the proposed Mackey Road Relocation corridor were also included in impact analyses performed for the Wright Area Coal LBA final Environmental Impact Statement (refer to item 2c, above).

3.2 Heritage - Cultural Resources

Existing Conditions

A Class I and a Class III cultural inventory were performed in 2009 by GCM Services, Inc. (GCM) along the initial Mackey Road Relocation corridor. GCM completed additional Class I and Class III inventories in 2010 and 2012 to accommodate reroutes at the northern and southern ends of the corridors, respectively. Those reroutes were developed to avoid sites that were evaluated as eligible or potentially eligible for the National Register of Historic Places (NRHP) and to meet Campbell County requirements. The complete, confidential survey reports are on file with the USFS Douglas Ranger District office in Douglas, Wyoming. Their results are summarized here.

Methods

A Class I report is a literature review and data search to determine whether previous cultural inventories have occurred in the project area and what, if anything, those surveys revealed. Sources for the Class I inventory include a Wyoming Cultural Records Office file search, the Wyoming Cultural Resource Information System on-line database, and GCM reports generated for other projects in the vicinity of the Mackey Road Relocation project.

The Class III cultural resources surveys were intensive and comprehensive pedestrian inventories of the proposed project area conducted by professional archaeologists and consultants. The surveys were designed to locate, identify, and record all prehistoric and historic cultural properties 50 years and older that have exposed surface manifestations. Transect intervals did not exceed 30 meters. All areas of subsurface exposure were examined particularly closely, including stream cut-banks, two-track road ruts, animal burrows, and anthills. Newly identified sites and isolated finds were recorded and plotted on U.S. Geological Survey 7.5 minute topographic maps. Site recording procedures included taking site photographs, drawing a sketch map, conducting shovel tests and/or probing with pin flags or probe devices, drawing or photographing artifacts with a high quality digital camera, and taking general notes on the site and environment. Some tools and features were plotted either with compass and pacing with reference to a mapping station, or with a recreational grade Global Positioning System (GPS) unit.

Any cultural properties encountered during the survey were evaluated for eligibility for inclusion in the NRHP. Determinations of eligibility are made by the managing federal agency in consultation with the State Historic Preservation Office (SHPO). If a property is determined to be not eligible for inclusion in the NRHP, no further work is required and the property can be disturbed without any further analysis or mitigation.

Inventory Results

A total of 13 sites and 5 isolated finds have been identified within the Mackey Road Relocation construction corridor. Ten (10) of the 13 sites are located on NFS lands, 2 are located on private

land, and 1 site spans both NFS and private lands. Four of the 13 sites had been previously recorded, and the remaining 9 were newly discovered during the 2009-2012 inventories.

One of the 13 sites is currently considered *eligible* for the NRHP. One new site is recommended as eligible. Two sites have a *not eligible* status with SHPO concurrence. The remaining nine sites are recommended as not eligible by GCM, including a previously recorded site that lacks a review or determination of eligibility. That site was not found within the study corridor and no further work is recommended.

The sites in the project corridor include 10 prehistoric properties, 2 historic properties, and 1 site with both historic and prehistoric components. Historic site or component types found in the survey area include a homestead and a rock cairn, and a stock dam with associated trash scatter. Prehistoric component types include five lithic scatters, five stone ring sites, and two camp/occupation sites.

Environmental Consequences (Effects Analysis)

Alternative 1: No Action

Under the No Action alternative, the existing alignments of the Mackey County Road and the directly adjoining segment of the Temporary Reno Road will be retained, and no new road construction will occur. Mining will not occur under the approximately 6.1 miles of the existing Mackey County Road and 2.2 miles of existing Temporary Reno Road within the NARM permit area.

The No Action alternative will result in no impact on cultural resources in the project area.

Alternative 2: Proposed Action

The Proposed Action could impact two cultural sites: one currently considered *eligible* for the NRHP and one recommended as eligible. If it is not possible to adjust the alignment to avoid those two sites, formal testing is recommended to better characterize their contributing portions and to facilitate a mitigation plan, if needed.

SHPO's determination of eligibility for one site and the final disturbance risk will be required to evaluate the impact of the project on historic or prehistoric resources in the proposed Mackey Road Relocation corridor. If the two sites will not be disturbed or the recommended site is determined to be ineligible, no impact to historic properties will occur as a result of the proposed road relocation. However, the following design criteria will apply:

- The discovery of any and all antiquities or other objects of historic or scientific interest including, but not limited to, historic or prehistoric ruins, or artifacts as the result of operations under this plan shall immediately be brought to the attention of the Forest Supervisor. The permittee shall cease operations until authorized to proceed by the Forest Supervisor.

Cumulative Effects for the Proposed Action

Destruction or degradation of documented or undocumented cultural resources within the project area will represent a cumulative and permanent loss of information about the history of the area. The project area falls entirely outside current and projected permit areas for nearby surface coal mines. The Proposed Action will result in approximately 292.7 acres of short-term surface disturbance on NFS lands during construction, and approximately 85.7 acres of permanent disturbance upon completion and transfer of the road easement to Campbell County. Increased access due to the proposed project may promote the incidental collecting of artifacts. Surface disturbance outside the proposed project area, but in the vicinity, will result mainly from expansion of existing surface coal mines. Additional impacts have already occurred and will continue to occur from other mineral extraction processes, such as oil and gas (conventional and CBNG) exploration and development, and their associated infrastructure. Conventional oil and gas development, ranching, and recreational activities are expected to contribute minimally to cumulative impacts to cultural resources due to the relatively limited nature and/or scope of those activities. Nevertheless, additional resources may continue to be discovered and/or destroyed as a result of mineral extraction activities surrounding the project area. However, the application of TBNG Plan Standard and Guidelines, appropriate project design criterion, and existing monitoring and mitigation measures required for development of federal coal minerals, and oil and gas reserves in the cumulative impact analysis area for the proposed project effectively protect existing heritage resources on federal surface.

Short-Term Use/Long-Term Productivity, Unavoidable Adverse Impacts, Irreversible or Irretrievable Impacts on Cultural Resources

No loss in long-term productivity is expected under either alternative.

No unavoidable adverse effects are expected under either alternative.

No new irreversible or irretrievable impacts on cultural resources will occur under either alternative.

3.3 Paleontological Resources

Existing Conditions

The region of the PRB where the project area is located is exclusively comprised of sedimentary rocks from the Lower-Middle Paleogene Period, dominated by the Fort Union Formation with minor exposures of the Wasatch Formation. As discussed below, the Fort Union and Wasatch formations are typically assigned ages of Paleocene and Eocene, respectively. However, the Paleocene-Eocene boundary cannot be solely defined by the contact between formations.

The Fort Union Formation, found only in the southern portions of the project area, has been interpreted to represent a basin-wide depositional system that included an open lake system that was peripherally filled by fluvially-dominated deltas (Ayers 1986). The Wasatch Formation, also found in the southern portion of the project area, has been interpreted to represent a fluvial system dominated by meandering channel belts (Pocknall 1987).

The USFS Rocky Mountain Region has developed a classification system of geological formations according to their probability of containing vertebrate fossil resources referred to as the Fossil Yield Potential Classification (FYPC). The FYPC is designed to provide the USFS management with a way to prioritize protection of paleontological resources. Under this system, surficial formations are classified on a scale of 1 to 5 (with 5 as the highest paleontological sensitivity) to reflect the likelihood of containing vertebrate fossils. A pedestrian survey of the potentially productive portions of a project area is required for formations ranked as levels 3 through 5.

The Wasatch Formation has a FYPC of 5, which is described as “highly fossiliferous geologic units that consistently and predictably produce vertebrate fossils and/or scientifically significant non-vertebrate (plant and invertebrate) fossils, and that are at risk of natural degradation and or human-caused adverse impacts (Appendix J, p. J-4 in USFS 2002).

The Fort Union Formation in the project area has been ranked as Class 3 under the FYPC system. Class 3 geologic units are defined by the USFS as “fossiliferous sedimentary geologic units where fossil content varies in significance, abundance, and predictable occurrence; or sedimentary units of unknown fossil potential.”

Methods

ARCADIS U.S., Inc. (ARCADIS) conducted a paleontological resource survey and prepared a subsequent report for the proposed Mackey Road Relocation in Campbell County, Wyoming. A background investigation was conducted to identify any publications, reports, collections records, or previous field surveys that detailed any paleontological discoveries in or near the project area. The USFS and the BLM also were consulted to identify any known paleontological resources in the vicinity of the project area. No previously discovered paleontological localities were identified within the project area.

Based on the background research, the limited extent of bedrock exposures, and the previous experience of ARCADIS in this area, the overall potential for discovering paleontological localities in the project area was considered moderate to low. A linear survey encompassing approximately 0.25 mile on either side of the centerline of the proposed road relocation was conducted, focusing attention on bedrock exposures and planar surfaces lacking vegetative cover. Anthills also were investigated.

Each newly discovered locality was recorded on a field data sheet. Site recording involved a detailed contextual description of the geology, stratigraphy and lithology of each locality if applicable. Specimens from each locality were identified in the field to the extent possible. GPS coordinates were collected as point features for each locality using a Trimble *Geo-XT* with sub-meter accuracy. A detailed photo log, including pictures of the fossils and outcrops, was completed for each locality.

The USFS Paleontologist from the Douglas Ranger District performed an additional pedestrian survey in response to the relocation of the southern portion of the proposed road alignment in T42N, R69W, Section 28. Most of the surveyed area was covered by vegetation, typically with less than 10% bare ground exposure. However, the survey area for the new addition did include a number of bedrock exposures of early Paleogene non-marine sediments. Many of the bedrock exposures were of baked mudstone and siltstone (clinker) and were absent of fossils.

Survey Results

Three distinct types of paleontological localities could potentially exist in the project area. The first consists of *in situ* paleontological resources weathering out from the point of original bedrock deposition. The second consists of identifiable paleontological resources for which the exact source location (and contextual information) cannot be determined. The third consists of unidentifiable paleontological resources (e.g. bone fragments) for which the source could not be determined and no contextual data could be recovered.

Three new paleontological localities were discovered during this survey. All three produced plant remains consisting of leaf impressions and/or petrified wood. Two of the localities were discovered in the Lebo Member of the Fort Union Formation and one was discovered in the Wasatch Formation. No vertebrate or invertebrate paleontological resources were discovered during this survey.

Environmental Consequences (Effects Analysis)

Alternative 1: No Action

Under the No Action alternative, the existing alignments of the Mackey County Road and the directly adjoining segment of the Temporary Reno Road will be retained, and no new road construction will occur. Mining will not occur under the approximately 6.1 miles of the existing Mackey County Road and 2.2 miles of existing Temporary Reno Road within the NARM permit area.

The No Action alternative will have no impact on paleontological resources in the project area.

Alternative 2: Proposed Action

The Proposed Action will likely have no impact on paleontological resources in the project area.

No paleontological resources of scientific significance were found during the reconnaissance surveys for this project. The localities of resources found will not likely be affected by road construction due to the terrain in which they are located. Additionally, these localities contain relatively common specimens and do not require additional mitigation measures. It is recommended that this project be allowed to proceed as planned with a finding of no adverse effect to paleontological resources. In the event that buried paleontological resources are discovered during construction operations, work should immediately be halted and the find reported to the Authorized Officer.

Because some potential to find resources during ground disturbance is possible, the following project design criterion will be applied:

- The discovery of any and all fossils or artifacts as the result of operations associated with the proposed project shall immediately be brought to the attention of the Forest Supervisor. The permittee shall cease operations until authorized to proceed by the Forest Supervisor.

Cumulative Effects for the Proposed Action

Destruction or degradation of documented or undocumented paleontological resources within the project area will represent a cumulative and permanent loss of information about the history of the area. The project area falls entirely outside current and projected permit areas for nearby surface coal mines. The Proposed Action will result in approximately 292.7 acres of short-term surface disturbance on NFS lands during construction, and approximately 85.7 acres of permanent disturbance upon completion and transfer of the road easement to Campbell County. Increased access due to the proposed project may promote the incidental collecting of fossils. Surface disturbance outside the proposed project area, but in the vicinity, will result mainly from expansion of existing surface coal mines. Additional impacts have already occurred and will continue to occur from other mineral extraction processes, such as oil and gas (conventional and CBNG) exploration and development, and their associated infrastructure. Conventional oil and gas development, ranching, and recreational activities are expected to contribute minimally to cumulative impacts to paleontological resources due to the relatively limited nature and/or scope of those activities. Nevertheless, additional resources may continue to be discovered and/or destroyed as a result of mineral extraction activities surrounding the project area. However, the application of TBNG Plan Standard and Guidelines, appropriate project design criterion, and existing monitoring and mitigation measures required for development of federal coal minerals, and oil and gas reserves in the cumulative impact analysis area for the proposed project effectively protect paleontological resources on federal surface.

Short-Term Use/Long-Term Productivity, Unavoidable Adverse Impacts, Irreversible or Irretrievable Impacts on Paleontological Resources

No loss in long-term productivity is expected under either alternative.

No unavoidable adverse effects are expected under either alternative.

No new irreversible or irretrievable impacts on paleontological resources will occur under either alternative.

3.4 Wildlife Resources

Wildlife analyses presented in this EIS tier to at least 14 separate NEPA analyses for projects on NFS lands that have already been approved by the USFS. Ten of the 14 analyses were for Biological Assessments/Biological Evaluations (BA/BEs), 3 were for environmental assessments, and 1 was for another EIS.

- Mackey Road Relocation BA/BE (2013)
- School Creek Mine Ancillary Facilities Special Use Permit Environmental Assessment (2012)
- North Antelope Rochelle Mine North Pit 69 kV Power Line Relocation and School Creek Mine 69 kV Power Line Spur Environmental Assessment (2010);
- BLM Wright Area Coal LBA Final Environmental Impact Statement (2010);
- Thunder Basin Travel Management Plan BA/BE (2009);
- Antelope Road Relocation Environmental Assessment (2009);
- Highway 450 to School Creek Mine Power Line BA/BE (2008);
- NARM's LBA3 Umbrella BA/BE (2006);

- Kennecott Energy's Antelope Coal Mine 69 kV Transmission Line Project BA/BE (2005);
- Boss Draw Power Line BA/BE (2005);
- AVF Exchange Drilling BA/BE (2005);
- Teckla Bulk Transmission Substation Enlargement BA/BE (2002);
- Porcupine (a.k.a. Teckla) Distribution Substation and Tie Line BA/BE (2002); and
- East Teckla Power Distribution Lines for the Peabody Gas Wells BA/BE (2002).

All USFS documents and Certifications of Acceptance or concurrence statements for those actions are on file with the Douglas Ranger District. The BLM coal document is available on that agency's website at <http://www.blm.gov/wy/st/en/info/NEPA/documents/hpd.html>.

Eight of those 14 analyses directly overlapped all or a portion of the Mackey Road Relocation analysis area (disturbance corridor and 1.0-mile or 4.0-mile perimeters, depending on the species). The remaining six analyses were farther away but encompassed the same habitats as those found in the analysis area.

The western two-thirds (66%) of the 4.0-mile analysis area for the Mackey Road Relocation project has been encompassed by annual monitoring efforts for nearby coal mines for many years. The northern half of both analysis areas (1.0-mile and 4.0-mile) has been monitored for various vertebrate species of concern annually from at least 1994 through 2013, and considerably longer for some species (e.g., sage-grouse and nesting raptors) as part of annual wildlife monitoring programs for adjacent coal mines, the Wyoming Game and Fish Department (WGFD), and/or USFS. Monitoring in the southern half of the analysis areas occurred from 2010 through 2013, with additional surveys conducted along the entire right-of-way corridor in 2012 and 2013. Some portions of the southern area also were surveyed prior to 2010 in conjunction with other overlapping projects. Surveys for all annual monitoring and NEPA projects were conducted by qualified biologists following appropriate agency protocols for data collection and reporting. All annual wildlife reports for coal mines are on file with the WDEQ in Sheridan or Cheyenne, Wyoming; annual updates to current umbrella BA/BE analyses are on file with the Douglas Ranger District in Douglas, Wyoming.

3.4.1 Federally Listed Threatened, Endangered, and Candidate Vertebrate Species

Existing Conditions

All federally endangered, threatened, candidate, and proposed species and their habitats that could potentially occur in the TBNG, or that are located on, adjacent to, or downstream of the proposed project area and could potentially be affected, were considered and/or selected for evaluation. The state of Wyoming does not maintain a separate list of T&E species. Table 3-2 lists those species known to occur or that have suitable habitat within the analysis area. Analyses of federal T&E plant species are presented in Section 3.5 of this document.

Table 3-2. Species occurrence and availability of suitable habitats for federally endangered, threatened, and candidate vertebrate species within the Mackey Road Relocation project area.

Evaluated Species	Potential for Occurrence in Project Area	Occurrence in Local Area	Presence of Habitat in Project Area
Black-footed ferret ^E <i>Mustela nigripes</i>	Very Unlikely ^{1,2,3}	Undocumented ^{1,2,3}	Limited ^{1,2,3}
Greater sage-grouse ^C <i>Centrocercus urophasianus</i>	Documented ^{1,2}	Documented ^{1,2}	Moderate ¹

¹ Based on USFWS block clearance for this species in black-tailed prairie dog colonies throughout Wyoming; USFS and TWC data collected from species-specific surveys in the analysis area; and baseline surveys and annual monitoring efforts conducted at local coal mines from 1984 through 2013 (summary reports of those data are on file with the USFS and WDEQ).

² Derived from Orabona et al. (2012) and/or the USFWS (2012).

³ As indicated by the USFS (2002), WGFD (Grenier 2004), and/or USFWS (2004) regarding designated black-footed ferret reintroduction areas and/or block clearance designations.

^E Classified as “Endangered” under the U.S. Endangered Species Act of 1973.

^C Classified as a “Candidate” for listing under the U.S. Endangered Species Act of 1973.

No current T&E vertebrate species have been observed in or within 1.0 mile of the Mackey Road Relocation project area. No critical habitats for federally listed species have been designated by the USFWS (2012) in the project area or on surrounding lands. Furthermore, the project area does not occur within any known or potential habitat for federal T&E species.

The endangered black-footed ferret (*Mustela nigripes*) is no longer listed for Campbell County, but it remains a federally listed species and is therefore discussed in this section. The candidate sage-grouse is known to occur in the project area and, therefore, also is included in this discussion.

Black-footed Ferret

The black-footed ferret is largely a nocturnal mammal and an obligate associate of prairie dogs (*Cynomys* spp.). This species relies exclusively on prairie dog colonies for food and shelter (Clark and Stromberg 1987). Ferrets produce one litter per year, typically giving birth to four or five kits. Currently, an introduced group in south-central Wyoming is the only known black-footed ferret population within the state, though other populations are present elsewhere in the United States and Mexico.

No active prairie dog colonies (potential black-footed ferret habitat) on NFS lands will be disturbed by the proposed project. No ferrets or their sign have ever been documented in the project area or at nearby coal mines despite repeated targeted surveys.

The LRMP has designated Management Area (MA) 3.63 specifically as Black-Footed Ferret Reintroduction Habitat; that MA is outside the analysis area for the proposed project. This MA

has management direction specifically designed to maintain and enhance black-footed ferret habitat. This direction was consulted on at the time the LRMP was developed, and, because this project does not propose to change any of that direction, no additional consultation is required. The USFWS issued a block clearance for black-footed ferrets in all black-tailed prairie dog colonies throughout Wyoming in 2004 (USFWS 2004). Consequently, it is highly unlikely that black-footed ferrets occur in the coal region of the PRB.

Sage-grouse

The following describes general life history information for the sage-grouse. This species is discussed in more detail in Section 3.4.3 (*Management Indicator Species* [MIS]) of this document, including information regarding population trends on the TBNG.

The sage-grouse occurs year-round throughout non-forested regions of Wyoming (Orabona et al. 2012). Sage-grouse rely on a variety of habitats within sagebrush dominated landscapes to reproduce and survive throughout the year. Early in the spring, grouse gather at breeding display sites called leks. Leks are usually in open areas (playas, ridge tops, sparse sagebrush, or burned areas) that are surrounded by dense sagebrush and escape cover. The surrounding area also typically represents nesting, loafing, and foraging habitat. Additional sage-grouse habitat can be found in small grassland openings, intermingled meadows, wetlands, and drainages next to sagebrush, where breeding and brood-rearing occur. Sage-grouse exhibit high fidelity to seasonal ranges, and some are known to return to the same area to nest in subsequent years.

Breeding populations of this species have declined by at least 17-47% throughout much of its range (Connelly et al. 2004) across the west. Within Wyoming, sage-grouse populations have generally declined over the past four decades. Sage-grouse population estimates specifically pertaining to the TBNG also suggest an overall downward trend (see Section 3.4.3, *Management Indicator Species*), though a slight upward shift has been recorded both statewide and within the Northeast Wyoming Sage-Grouse Local Working Group (NWSGWG) area in some recent years.

The USFS estimates that approximately 438,000 acres of potential sage-grouse habitat (sagebrush and grassland mixture) is currently available to grouse on the TBNG (Appendix H in USFS 2002). The NWSGWG (2006) identified habitat fragmentation and degradation, disturbance, and direct mortality as major influences affecting sage-grouse. The group identified oil and gas development, vegetation management, invasive plants, and weather as those factors with the most influence on the northeast Wyoming sage-grouse populations, and those that may most effectively be addressed to provide the greatest benefit for sage-grouse conservation in that region. Similar factors have been identified by the USFS (2002), particularly when they occur during critical periods of the life cycle such as breeding, nesting, and stressful winter conditions. Changes in fire regimes (Knick et al. 2003), both related and unrelated to cheatgrass, and an increasing presence of traffic and/or vertical structures such as communication towers, wind turbines, and overhead power lines are additional factors that affect sage-grouse habitats and populations.

The Mackey Road Relocation project is not within current sage-grouse core or connectivity areas (State of Wyoming 2011). Furthermore, none of the six sage-grouse lek sites known to be within 4.0 miles of the project area are within a core population area. The nearest core area is

approximately 4.0 miles east of the project area and 3.25 miles east of the outer-most lek (Tracy Waterhole). To protect wildlife resources, the exact locations of sage-grouse leks are not provided in this document, but are on file with the Douglas Ranger District.

Two active sage-grouse leks are present within 4.0 miles of the project area: Payne and Tracy Waterhole. Four inactive lek sites also are present in that analysis area: Rochelle, Wilson, Kort I, and Kort II. The USFS defines active leks as having attending males present during at least 1 of the most recent 5 years, whereas inactive leks have not had attending males present in the most recent 5-year period (USFS 2002, page 1-18). This is in contrast to the WGFD lek management status definitions, which extend out to a 10-year assessment period. Because the project affects NFS lands, the USFS definitions are used for this analysis.

Peak male counts at both active leks have historically been low, with an average of approximately 7 males per year at the Payne lek and 14 males per year at the Tracy Waterhole lek since their respective discoveries. Peak male counts have declined at both sites over the last few years (pre-disturbance). As noted, all other leks in the analysis area are inactive by USFS classification.

Grouse were last documented at the Rochelle lek in 1999, and it was disturbed by mining activities in 2004. The Wilson and Kort leks were last active in 1997, 2004, and 2006, respectively. The Wilson and Kort II leks were disturbed by mine operations in 2011, and the Kort I lek was disturbed by mine activities in 2012. All mine related disturbance at and within 2.0 miles of these leks occurred during the non-breeding season to minimize potential impacts on breeding or nesting grouse. As stated, all four of these leks have been inactive for at least the last 5 years.

Results from the long-term annual monitoring and telemetry study have demonstrated that sage-grouse use of the project area has been concentrated in the central portion of the project area (i.e., construction corridor) and 4.0-mile analysis area since at least 2001. However, the quality of available sagebrush habitat varies widely throughout the area, ranging from heavily grazed, sparse sagebrush stands with little residual grasses to moderately dense stands of sagebrush intermingled with good quality residual grasses. Although some sagebrush is present, the western quarter of the analysis area is dominated by upland grassland communities, particularly in the southwestern corner. Consequently, the analysis area consists of both occupied and unoccupied habitat. More details regarding sage-grouse and their habitats within the analysis area are provided in Section 3.4.2 (*Sensitive Species*) and Section 3.4.3 (*Management Indicator Species*) of this document.

Environmental Consequences (Effects Analysis)

A summary of determinations of effect for vertebrate T&E species is provided in Table 3-3.

Table 3-3. Determinations of effect and their primary justification for federally listed (threatened, endangered, candidate, proposed, petitioned) vertebrate species (through 2013) within the Mackey Road Relocation project area.

Evaluated Species	Effects Determination		Justification
	Alternative 1 ¹ (No Action)	Alternative 2 (Proposed Action)	
Black-footed ferret	No Effect	No Effect	Block cleared in region by USFWS; no record of species presence; beyond USFS reintroduction MA; no disturbance of potential foraging habitat on NFS lands.
Greater sage-grouse (without mitigation)	Is likely to result in a trend to federal listing or loss of viability in the planning area	Is likely to result in a trend to federal listing or loss of viability in the planning area	Two active leks present within 4.0 miles; no leks disturbed but exposed to long-term increase in traffic and noise levels within 0.6 mile of nearest lek; construction during non-breeding season within 2.0 miles of active leks; final alignment beyond USFS surface occupancy limits and beyond view of nearest active lek; limited habitat impacts during construction but increased long-term habitat fragmentation; limited physical disturbance of other suitable seasonal habitats (see BE and MIS for additional information); increased long-term human presence; potential for increased use of travel corridors by mammalian predators.
Greater sage-grouse (with mitigation)	May adversely impact individuals ²	May adversely impact individuals ²	Impacts from above offset by required on-site and off-site mitigation measures to be implemented in sage-grouse habitat on the TBNG before, during, and/or following construction. Voluntary conservation measures implemented by PPRM within the NARM permit area, and at adjacent mines, under a pending CCAA/CCA ³ in northeast Wyoming also will help offset potential impacts from this project.

¹ Impacts under the No Action alternative will be due to implementation of previously permitted mining operations and other energy projects, as well as non-energy activities in the area.

² May adversely impact individuals but not likely to cause a trend to federal listing or loss of viability within the planning area.

³ CCAA/CCA = Candidate Conservation Agreement with Assurances/Candidate Conservation Agreement; voluntary, large scale conservation program under development in collaboration with the USFWS and federal land management agencies in northeast Wyoming, including the TBNG.

Alternative 1: No Action

Under the No Action alternative, the existing alignments of the Mackey County Road and the directly adjoining segment of the Temporary Reno Road will be retained, and no new road construction will occur. Mining will not occur under the approximately 6.1 miles of the existing Mackey County Road and 2.2 miles of existing Temporary Reno Road within the NARM permit area.

The No Action alternative will have no new effects on current T&E species in the project area.

Black-footed Ferret

The No Action alternative will have no effect on current T&E species within the project area, as no such species occur or are scheduled for release there or on immediately adjacent lands (i.e., within the 1.0-mile analysis area). Indirect impacts on potential black-footed ferret habitat will be limited to potential mortalities of prey items (individual prairie dogs) from existing vehicular traffic through, and/or recreational shooting in, the affected colony; that colony is on private surface.

Potential black-footed ferret habitat on NFS lands within the TBNG is already protected by the current LRMP. Under that document, reintroduction habitat for black-footed ferrets will be maintained and enhanced; that reintroduction habitat is outside the analysis area for this project. Currently, no negative impacts are occurring in black-footed ferret habitat. With no anticipated change in the current use, no expected direct or indirect impacts on this habitat will occur.

Sage-grouse

Only two of the six leks within the 4.0-mile analysis area are still active. Five of the six lek sites are within the existing permit area for one or more mines and, therefore, are already subject to mine related disturbance regardless of actions taken on this proposal. Four of those five sites have already been eclipsed by mine operations and disturbance at the fifth lek is imminent, even under the No Action alternative. The active Tracy Waterhole lek is on private surface, and is the only one of the six leks in the analysis area that is located beyond a current mine permit boundary. However, this lek is currently exposed to regular disturbance from road traffic on a scoria oil field road located within 100 yards and in view of the lek. Per USFS standards, surface disturbance on NFS lands within 2.0 miles of active leks occurs only during the non-breeding season, regardless of whether or not the lek itself is on NFS lands.

Due to the presence of previous, existing, or imminent disturbance near all sage-grouse leks in the analysis area, implementation of the No Action alternative will not preclude additional short- or long-term effects on individuals or suitable habitat (occupied and unoccupied) in that area. The No Action alternative also will not delay or decrease the magnitude of those impacts within the Geographic Area or elsewhere in the TBNG. Furthermore, due to the downward trend of sage-grouse populations throughout the TBNG, even this alternative could conflict with the current TBNG LRMP or future objectives to manage the area for sage-grouse unless appropriate conservation and/or mitigation measures are implemented. The timely implementation of those measures, along with additional voluntary conservation measures being implemented by PPRM and adjacent mines (described under Cumulative Effects, below), will sufficiently reduce overall impacts to maintain a viable population within the planning area. More details regarding impacts on sage-grouse and their habitat are provided in Section 3.4.2 (*Sensitive Species*) and Section 3.4.3 (*Management Indicator Species*) of this document.

Alternative 2: Proposed Action

The Proposed Action will result in approximately 292.7 acres of short-term surface disturbance on NFS lands during construction, and approximately 85.7 acres of permanent disturbance upon completion and transfer of the road easement to Campbell County.

Black-footed Ferret

The Proposed Action will have no effect on current T&E species within the project area, as no such species occur or are scheduled for release there or on immediately adjacent lands (i.e., within the 1.0-mile analysis area). Indirect impacts on potential black-footed ferret habitat (one prairie dog colony) will occur on approximately 8.6 acres on private surface during construction, with 2.9 acres of that colony within the final right-of-way. No colonies on NFS lands will be disturbed by the project. Additional indirect impacts include mortalities of prey items (individual prairie dogs) from existing vehicular traffic through, and/or recreational shooting in, the affected colony on private surface.

Potential black-footed ferret habitat within the TBNG is already protected by the current LRMP. Under that document, reintroduction habitat for black-footed ferrets will be maintained and enhanced; that reintroduction habitat is outside the analysis area for this project. Currently, no negative impacts are occurring in black-footed ferret habitat. With no anticipated change in the current use, no expected direct or indirect impacts on this habitat will occur.

Sage-grouse

Direct loss of, or injury to, individual sage-grouse residing within the project area could result from vehicle collisions from equipment associated with road construction or post-construction use by the general public. Additional direct effects could result from collision with new fence lines that might be built in previously undisturbed flight paths and/or use of new travel corridors by mammalian predators.

No sage-grouse leks will be physically disturbed under the Proposed Action, either on or off NFS lands. However, birds attending those leks could be directly impacted by collisions with vehicles or new fences, predated, or deterred from using active lek sites due to increased noise from nearby traffic upon completion of the new road. The Tracy Waterhole lek is the nearest active lek to proposed disturbance. That lek is currently exposed to periodic oil and gas traffic on the scoria road approximately 100 yards west of the lek. The proposed construction corridor (project area) is approximately 0.6 mile west and beyond view of the Tracy Waterhole lek, which is beyond the USFS surface occupancy buffer distance (0.25 mile). The active Payne lek is approximately 3.8 miles west and beyond view of the project area. That lek is currently exposed to existing oil production, road traffic, and encroaching mine operations. Per USFS standards, surface disturbance on NFS lands within 2.0 miles of active leks occurs only during the non-breeding season, regardless of whether or not the lek itself is on NFS lands.

Despite these considerations, sage-grouse and their habitats will be affected under the Proposed Action. As noted, the project will disturb approximately 292.7 short-term acres (i.e., during construction) and 85.7 long-term acres (new infrastructure and post-construction maintenance)

on NFS lands. The latter total will be within the final 100-foot right-of-way for the relocated road. Much of the disturbance corridor will follow or be near existing roads and two-tracks, though the new right-of-way corridor will be considerably wider than current road conditions and designed to accommodate two-way traffic when finished. Suitable sage-grouse habitat does not occur along the entire length of the proposed construction corridor. However, construction activities and post-construction use of the relocated road will result in altered and/or fragmented sage-grouse habitats either not currently subject to such disturbance or not currently exposed to traffic levels expected to occur upon completion of the project. The introduction of invasive and/or weedy plant species also is possible as equipment and other vehicles enter the project area during construction, operation, or maintenance of the new road. Increased levels of dust and noise also are likely to result from the project, both during and after construction. In addition to increased vehicular traffic, greater public access to NFS lands post-construction will likely lead to an increase in year-round recreational activities such as hiking and hunting that could be disruptive to any sage-grouse nesting or foraging in the area.

The timing of the project during the non-breeding season will minimize potential impacts on sage-grouse and their habitats during construction, but will not alleviate impacts, especially long-term impacts associated with the final right-of-way. Descriptions of required mitigation measures to offset impacts to sage-grouse are provided under *Required Mitigation*, below. Timely implementation of these measures in suitable habitat on- and off-site within the TBNG, along with additional voluntary conservation measures being implemented by PPRM and adjacent mines (described under *Cumulative Effects*, below), will sufficiently reduce overall impacts to maintain a viable population within the planning area. Additional details regarding potential impacts under the Proposed Action are described in Section 3.4.2 (*Sensitive Species*) and Section 3.4.3 (*Management Indicator Species*) of this document.

Cumulative Effects for the Proposed Action

According to 50 CFR, Part 402, Subpart A – General, Cumulative Effects are defined as “*those effects of future State or private activities, not involving Federal activities that are reasonably certain to occur within the action area of the Federal action subject to consultation.*”

Cumulative short- and long-term disturbances considered in this analysis arise from multiple sources that are currently present or could occur on all lands within the Mackey Road Relocation analysis area. Many of these activities include private or state lands or mineral ownership and may involve any or all jurisdictions. They also include direct and indirect impacts of past, present, and reasonably foreseeable future activities. All mine-related disturbances on existing coal leases have already been reviewed and approved by the Douglas Ranger District as part of previous NEPA analyses for multiple projects at nearby coal mines.

Coal mining will continue on private, state, and federal mineral estates within the current mine permit areas for the nearby NARM and other overlapping mines. Other existing operations and infrastructure previously permitted to occur within the analysis area also will be continued, including (but not limited to) activities associated with scoria mining, oil and gas (conventional and CBNG), road construction and improvements, increased rail transportation lines, utility and communication lines, rural housing development, livestock grazing, hunting, and other forms of dispersed recreation. Within the reasonably foreseeable future, minerals extraction is expected to

increase in portions of the analysis area. Disturbances such as pipelines, power lines, roads, and facilities tend to fragment or reduce the effectiveness of remaining habitats within the vicinity of development. In addition, these activities often result in increased noise and dust levels, new long-term or permanent facilities, potential introduction of invasive and/or weedy plant species, and a generally increased human presence, among others. Factors such as drought, the appearance of new diseases (e.g., West Nile Virus), and changes in the local fire regime also can compound cumulative impacts. An incremental loss of wildlife habitat will occur in the general vicinity as a result of several of these factors, with some wildlife species affected until reclaimed habitats are established in disturbed areas outside permanent rights-of-way or plant succession restores areas affected by natural causes such as fire or drought. A total of 85.7 additional acres of long-term disturbance on NFS lands will occur under the Proposed Action.

Black-footed Ferret

The Proposed Action will have no direct effects on black-footed ferrets because the species does not occur, and is not scheduled for release, in the project or analysis areas. Minimal acreages of potential foraging habitat for this species will be affected; those effects will not occur on NFS lands. Therefore, neither alternative will contribute to cumulative impacts on black-footed ferrets.

While continued mineral development and its associated infrastructure are expected to continue on private and state lands, none of this is expected to occur in or near the Black-footed Ferret Reintroduction MA. To the best of the USFS's knowledge, no other known or proposed changes to these historical uses are planned. It appears that conditions on private and state-owned lands in the analysis area under the No Action alternative will not change dramatically from current conditions in the near future for this species.

Sage-grouse

The analysis area encompasses both occupied and unoccupied sage-grouse habitat; NFS lands within the analysis area represent less than 0.01% of the entire TBNG. Five of the six lek sites within the 4.0-mile analysis area for sage-grouse are within an existing permit area for one or more of the nearby coal mines. As a result, all five leks (one active, four inactive) are subject to proximate and ultimate physical disturbance regardless of actions taken on this proposal. The active Tracy Waterhole lek is the only one of the six leks in the analysis area that is located beyond a current mine permit boundary; that lek is approximately 0.6 mile east and beyond view of the proposed road corridor. The Tracy Waterhole lek is currently exposed to regular disturbance from road traffic on a scoria oil field road located within 100 yards and in view of the lek. Long-term telemetry data in the vicinity have documented that sage-grouse use is concentrated in the central portion of the analysis area. More details regarding impacts on sage-grouse and their habitat are provided in Section 3.4.2 (*Sensitive Species*) and Section 3.4.3 (*Management Indicator Species*) of this document.

While impacts can and have occurred in many places across the TBNG, some areas continue to provide suitable, occupied sage-grouse habitat that serves the region as a whole. Nevertheless, cumulative impacts are expected to cause a direct loss or degradation of seasonal or year-round sage-grouse habitats, including long-term impacts in all habitat types found within existing and

pending mine permit boundaries. Disturbances such as pipelines, power lines, roads, and other infrastructure tend to fragment or reduce the effectiveness of remaining habitats within the vicinity of development. Noise, increased human presence, new fence construction, increased predation (from wildlife and domestic pets), introduction of invasive and/or weedy plant species, and/or changes in fire regimes often accompany these types of development. The additional and synergistic impacts from other factors including, but not limited to, drought, disease, grazing, off-road vehicle use, and other forms of recreation also continue to adversely impact year-round sage-grouse habitat, especially sagebrush stands and nearby aquatic habitats (potential brood rearing habitat).

Per USFS standards, surface disturbance on NFS lands within 2.0 miles of active leks occurs only during the non-breeding season, regardless of whether or not the lek itself is on NFS lands. Energy extraction activities have requirements for reclamation of disturbed sites as areas are altered and resources are depleted. These restrictions and requirements will help mitigate future habitat losses, although the full benefits from reclaimed sagebrush stands will not be realized for many years, possibly decades, after the reclamation or decommissioning phases of the projects. Habitat losses due to rural housing developments should be considered permanent. As with all lands administered on the TBNG, further consolidation of lands through land exchange will occur as opportunities arise.

Ongoing and previously permitted surface disturbance will continue in the analysis area regardless of whether or not the proposed project is approved. Therefore, precluding the project by selection of the No Action alternative will not eliminate additional short- or long-term effects on sage-grouse habitat, sage-grouse population viability, or the distribution of sage-grouse across the TBNG. More details regarding impacts on sage-grouse and their habitat are provided in Section 3.4.2 (*Sensitive Species*) and Section 3.4.3 (*Management Indicator Species*) of this document. Descriptions of required mitigation measures to offset project-related impacts to sage-grouse are provided under *Required Mitigation*, below.

However, in addition to USFS Standards and Guidelines and project-specific mitigation requirements for sage-grouse, PPRM's long-term (2006-present) involvement in the ongoing, voluntary development of a joint Candidate Conservation Agreement with Assurances/Candidate Conservation Agreement (CCAA/CCA) in collaboration with other local mines, the USFWS, and other federal land management agencies in northeast Wyoming will ensure that conservation measures for sage-grouse will continue to be implemented under either alternative. The timely implementation of such conservation and mitigation measures in suitable habitats on- and off-site within the TBNG will sufficiently reduce overall impacts to maintain a viable population of sage-grouse within the planning area.

Determination of Effects and Rationale

The No Action alternative will have **no effect** on T&E species due to their documented absence from the area and lack of plans to reintroduce them.

Implementation of the Proposed Action also will have **no effect** on T&E species due to their documented absence from the area and lack of plans to reintroduce them.

Black-footed Ferret

The Proposed Action will have **no effect** on black-footed ferrets. Given the documented absence of this species during targeted surveys conducted throughout the region in the past, the minimal (8.6 acres [2% of total] on private surface) physical disturbance of potential ferret habitat associated with the Proposed Action, the block clearance issued by the USFWS for black-tailed prairie dog colonies throughout Wyoming, and the distance of the analysis area from future reintroduction sites, the Mackey Road Relocation project will not affect black-footed ferrets. Furthermore, the proposed project will not conflict with the current TBNG LRMP, or any future objectives to manage the area and reintroduce ferrets into the TBNG.

Sage-grouse

Without mitigation, both the Proposed Action and No Action alternative are likely to result in a trend to federal listing or loss of viability in the planning area for sage-grouse on the TBNG. Impacts from existing activities, natural factors, and changes in timing and/or severity of natural events due to human influences will continue under either alternative. Long-term telemetry data have documented that sage-grouse use limited portions of the analysis area, including lands near the proposed road corridor in some locations. Impacts such as increased levels of traffic, noise, dust, permanent infrastructure, human presence, and potential use of new travel corridors by mammalian predators will occur both during and after construction. Impacts from all of these factors will have both short- and long-term effects on sage-grouse habitat, sage-grouse population viability, and the distribution of sage-grouse across the TBNG.

However, the timely implementation of mitigation measures in suitable habitat on- and off-site within the TBNG, along with additional voluntary conservation measures being implemented by PPRM and other local mines as part of the ongoing CCAA/CCA development throughout the region, will sufficiently reduce overall impacts to maintain a viable population within the planning area. Therefore, the Proposed Action and No Action alternative **may impact individuals but not likely to cause a trend to federal listing or loss of viability in the planning area.**

Required Mitigation

The following mitigation measures will be required under the Proposed Action. During road construction, PPRM will be required to mitigate on-site impacts through the use of dust suppression methods and materials, and to adhere to timing restrictions (i.e., USFS Standards) designed to protect active lek sites. Reclamation of newly disturbed areas beyond the final right-of-way will occur upon completion of construction, and will be accomplished using appropriate methods and seed mixes. The company may voluntarily choose to continue dust suppression for some time post-construction as a good faith effort.

PPRM also will be required to implement off-site mitigation measures in appropriate sage-grouse habitat elsewhere on the TBNG before, during, or after construction. Such measures could include, but are not limited to: cheatgrass treatments, weed control, conifer removal in sagebrush stands, shrub removal in drainages (i.e., brood-rearing habitat) through mowing, water development or enhancement in brood-rearing habitats, windmill removals in favor of solar

power, or other measures identified collaboratively by PPRM and the USFS as beneficial to sage-grouse.

Monitoring

Surveys for federally listed species (including candidate species) will be conducted in the future, as determined necessary by the USFS, to monitor the effects of the project on populations.

3.4.2 USFS Region 2 - Sensitive Species

Additional species considered are those identified by the Regional Forester as sensitive species. Species are classified as sensitive when they meet one or more of the following three criteria: 1) The species is declining in numbers or occurrences, and evidence indicates it could be proposed for federal listing as threatened or endangered if action is not taken to reverse or stop the downward trend; 2) The species habitat is declining, and continued loss could result in population declines that lead to federal listing as threatened or endangered if action is not taken to reverse or stop the decline; and 3) The species population or habitat is stable but limited. In addition to the above criteria, a ranking system is used to identify species for Sensitive status, which is outlined in USFS Manual 2670 - 2671.

Existing Conditions

The USFS has developed a list of sensitive mammals, birds, amphibians, reptiles, fish, insects, mollusks, and plants for Region 2 (including the TBNG). That list was last updated in June and September 2011, as shown in Appendix D of the wildlife Biological Assessment/Biological Evaluation for this project (on file with the Douglas Ranger District) and USFS Manual Chapter 2670, Digest 2672.11, Supplement No. R2_2600-2011-1, Exhibit 01. Sensitive plant species are addressed in Section 3.5 (*Vegetation Resources*) of this EIS and in the vegetation Biological Assessment/Biological Evaluation document, on file with the Douglas Ranger District.

Thirty-three vertebrate species on the current Region 2 sensitive species list, and known or suspected to occur on the TBNG, were reviewed to determine which should be considered for full evaluation for the Mackey Road Relocation project. Table 3-4 lists those 33 species, including descriptions of their primary habitats, whether or not the species has been documented on the TBNG, and habitat suitability in the project area (i.e., habitat present in, near, or downstream of the proposed project area). If a species was known to occur in or near the proposed project area, or if suitable but unoccupied habitat was present and will be disturbed by the Proposed Action, then potential effects were evaluated. If suitable habitat was not present, or was present but will not be impacted, further analysis was not conducted. Justifications for eliminating species from further consideration are also included in Table 3-4, as appropriate.

Twenty-two of the 33 vertebrate species could potentially be impacted by the proposed project (Table 3-4). A summary of the determinations of effects under each alternative and primary justifications under the Proposed Action alternative are listed in Table 3-5 for each evaluated species. Species requiring different habitats (certain hawks and songbirds), elevations, or other features than those found in the analysis area were eliminated due to the lack of such features in

Table 3-4. Current¹ USFS Region 2 sensitive species list for TBNG (vertebrate fauna): General habitat characteristics and presence², species occurrence, and rationale if excluded from analysis for the Mackey Road Relocation project³.

Common Name <i>Scientific name</i>	Primary Habitats	Occurrence on TBNG	Suitable Habitat in Project Area	Rationale if Not Carried Forward for Analysis
Mammals				
Townsend's big-eared bat <i>Plecotus townsendii</i>	Caves and abandoned mines	Documented	Extremely Limited	Evaluated due to potential foraging habitat
Black-tailed prairie dog <i>Cynomys ludovicianus</i>	Grassland Shrub-grasslands	Documented	Suitable	Evaluated
Hoary bat <i>Lasiurus cinereus</i>	Coniferous forests, woodlands, grasslands, and shrublands	Documented	Limited	Evaluated due to potential foraging habitat
Fringed myotis <i>Myotis thysandes</i>	Coniferous forests, woodlands, grasslands, and shrublands,	Documented	Limited	Evaluated due to potential foraging habitat
Swift fox <i>Vulpes velox</i>	Grassland Shrub-grasslands	Documented	Moderate	Evaluated
Birds				
Northern goshawk <i>Accipiter gentilis</i>	Douglas fir/lodgepole pine forests, Aspen	Documented	None	No habitats within buffer, no impact to habitat
Grasshopper sparrow <i>Ammodramus savannarum</i>	Short-grass prairie, Shrub-steppe	Documented	Moderate	Evaluated
Sage sparrow <i>Amphispiza bellii</i>	Shrub-steppe, montane shrublands	Documented	None	Project area is beyond typical range for this species
Burrowing owl <i>Athene cunicularia</i>	Grasslands, shrub-steppe	Documented	Suitable	Evaluated
American bittern <i>Botaurus lentiginosus</i>	Wetlands, marshes	Documented	Extremely Limited	Evaluated
Ferruginous hawk <i>Buteo regalis</i>	Grassland Shrub-steppe	Documented	Suitable	Evaluated
McCown's longspur <i>Calcarius mccownii</i>	Short-grass prairie, shrub-steppe	Documented	Limited	Evaluated
Chestnut-collared longspur <i>Calcarius ornatus</i>	Short-grass prairie	Documented	Limited	Evaluated
Greater sage-grouse <i>Centrocercus urophasianus</i>	Shrub-steppe	Documented	Moderate	Evaluated
Mountain plover <i>Charadrius montanus</i>	Short grasslands, prairie dog colonies	Documented	Limited	Evaluated
Black tern <i>Chlidonias niger</i>	Ponds, Lakes, Wetlands	Documented	None	No impact to open water bodies
Northern harrier <i>Circus cyaneus</i>	Grasslands	Documented	Suitable	Evaluated
Yellow-billed cuckoo <i>Coccyzus americanus</i>	Plains/Basin riparian	Documented	None	No habitat impacts
Olive-sided flycatcher <i>Contopus cooperi</i>	Boreal forests	Documented	None	No habitat impacts

Table 3-4. Continued.

Common Name <i>Scientific name</i>	Primary Habitats	Occurrence on TBNG	Suitable Habitat in Project Area	Rationale if Not Carried Forward for Analysis
American peregrine falcon <i>Falco peregrinus</i>	Tall cliffs, riverine systems, open prairie	Documented	Limited	Evaluated due to potential foraging habitat
Bald eagle <i>Haliaeetus leucocephalus</i>	Mature conifer or deciduous habitats, often near water	Documented	Suitable	Evaluated
Loggerhead shrike <i>Lanius ludovicianus</i>	Shrub-steppe	Documented	Suitable	Evaluated
Lewis' Woodpecker <i>Melanerpes lewis</i>	Low elevation conifer, plains/basin riparian	Documented	Limited	No habitat impacts
Long-billed curlew <i>Numenius americanus</i>	Grassland Shrub-steppe	Documented	Limited	Evaluated
Flammulated owl <i>Otus flammeolus</i>	Montane ponderosa pine	Species or habitat suspected, unconfirmed	Limited	No habitat impacts
Brewer's sparrow <i>Spizella breweri</i>	Shrub-steppe, montane shrublands	Documented	Moderate	Evaluated
Reptiles/Amphibians				
Northern leopard frog <i>Lithobates pipiens</i>	Persistent deep water, emergent vegetation	Documented	Suitable	Evaluated
Fish				
Plains minnow <i>Hybognathus placitus</i>	Larger streams	Documented	Suitable	Evaluated
Flathead chub <i>Platygobio gracilis</i>	Swift, turbid rivers	Documented	Suitable	Evaluated
Mountain Sucker <i>Catostomus platyrhynchus</i>	Low gradient streams with riffles, pools, runs	Undocumented	Unsuitable	Habitat Unsuitable
Lake Chub <i>Couesius plumbeus</i>	Small, clear streams with permanent spring flow (headwaters)	Undocumented	Unsuitable	Habitat Unsuitable
Sturgeon Chub <i>Macrhybopsis gelida</i>	Main channels of turbid rivers or near sand or gravel bars	Undocumented	Unsuitable	Habitat Unsuitable
Finescale dace <i>Phoxinus neogaeus</i>	Cool, boggy lakes and sluggish streams	Undocumented	Unsuitable	Habitat Unsuitable

¹ June 2011 for mammals and birds, September 2011 for fish and amphibians.

² No high elevation coniferous forests or thick cottonwood-riparian corridors are present and/or will be disturbed in the project area; limited pine trees are present within 0.5 mile of the project area; beyond range of some species.

³ The project area includes a 300-to-700-foot construction corridor across approximately 7.1 miles of NFS land, or approximately 292.7 acres.

the project area or the absence of physical disturbance of those habitats within the project corridor. The sage-grouse also is included in Section 3.4.3 (*Management Indicator Species*) of this document.

A pre-field review of available information was conducted to assemble occurrence records and describe habitat needs and ecological requirements for each species. Sources of regional information included: Douglas Ranger District wildlife geographic information system (GIS) data (2010); TBNG Travel Management Plan BA/BE (2009), WGFD wildlife occurrence records (Orabona et al. 2012); Bureau of Land Management (BLM)-Buffalo Field Office wildlife data (USFS 2010); wildlife data collected by TWC at neighboring surface coal mines (NARM, School Creek, and Black Thunder [includes former North Rochelle Mine]) from the mid-1980s through early 2013; current scientific literature; and other available reports pertaining to the biology of those species. Wildlife survey boundaries and features within the project and analysis areas are depicted in Appendix A of the supporting BA/BE, on file with the Douglas Ranger District. All surveys were conducted according to current agency protocols; results from those efforts are included where surveys have been completed. All operators and the Douglas Ranger District will be notified immediately of any known or potential conflicts identified during those field surveys, and Standards and Guidelines will apply, as appropriate.

Table 3-5. Determinations of impact for 22 USFS Region 2 Vertebrate sensitive species evaluated under the No Action and Proposed Action alternatives for the Mackey Road Relocation project, and primary justifications under the Proposed Action.

Evaluated Species	Impacts Determination		Justification
	No Action Alternative ¹	Proposed Action Alternative	Proposed Action Alternative
Mammals			
Townsend's big-eared bat	May adversely impact individuals ²	May adversely impact individuals ²	Minimal risk of impacts; limited disturbance of foraging habitat; effects minimized by project timing during fall/winter months.
Black-tailed prairie dog	May adversely impact individuals ²	May adversely impact individuals ²	Limited risk of impacts; no physical disturbance/loss of habitat on NFS lands; 8.6 acres habitat disturbance on private surface (2% of total active colony acreage in analysis area).
Hoary bat	May adversely impact individuals ²	May adversely impact individuals ²	Limited disturbance of foraging habitat; effects minimized by project timing during fall/winter months.
Fringed myotis	May adversely impact individuals ²	May adversely impact individuals ²	Minimal risk of impacts; limited disturbance of foraging habitat; effects minimized by project timing during fall/winter months.
Swift fox	May adversely impact individuals ²	May adversely impact individuals ²	No sightings within 1.0-mile analysis area during long-term monitoring; limited suitable habitat; effects minimized by timing limitations.
Birds			
Grasshopper sparrow	May adversely impact individuals ²	May adversely impact individuals ²	No documented sightings or nesting efforts; limited potential habitat; effects minimized by timing limitations.

Table 3-5. Continued.

Evaluated Species	Impacts Determination		Justification
	No Action Alternative ¹	Proposed Action Alternative	Proposed Action Alternative
Burrowing owl	May adversely impact individuals ²	May adversely impact individuals ²	No documented nesting efforts in project area over last 20+ years; few sightings in area; no habitat disturbance in active prairie dog colonies on NFS lands; 8.6 acres habitat disturbance on private surface (2% of total active colony acreage in analysis area); effects minimized by timing limitations.
American bittern	May adversely impact individuals ²	May adversely impact individuals ²	No documented presence in area over last 20+ years; limited potential habitat; effects minimized by timing limitations.
Ferruginous hawk	May adversely impact individuals ²	May adversely impact individuals ²	No physical impacts on known nest sites; limited disturbance of foraging habitat; increased risk of vehicular collisions; effects minimized by timing limitations.
McCown's longspur	May adversely impact individuals ²	May adversely impact individuals ²	Few sightings in area; no documented nesting efforts; limited suitable habitat present; effects minimized by timing limitations.
Chestnut-collared longspur	May adversely impact individuals ²	May adversely impact individuals ²	No sightings in area; no documented nesting efforts; limited suitable habitat present; effects minimized by timing limitations.
Greater sage-grouse (without mitigation)	Is likely to result in a trend to federal listing or loss of viability in the planning area	Is likely to result in a trend to federal listing or loss of viability in the planning area	Two active leks present within 4.0 miles; no leks disturbed but exposed to long-term increase in traffic and noise levels within 0.6 mile of nearest lek; construction during non-breeding season within 2.0 miles of active leks; final alignment beyond USFS surface occupancy limits and beyond view of nearest active lek; limited habitat impacts during construction but increased long-term habitat fragmentation; limited physical disturbance of other suitable seasonal habitats (see BE and MIS for additional information); increased long-term human presence; potential for increased use of travel corridors by mammalian predators.
Greater sage-grouse (with mitigation)	May adversely impact individuals ²	May adversely impact individuals ²	Impacts from above offset by required on-site and off-site mitigation measures to be implemented in sage-grouse habitat on the TBNG before, during, and/or following construction. Voluntary conservation measures implemented by PPRM within the NARM permit area, and at adjacent mines, under a pending CCAA/CCA ³ in northeast Wyoming also will help offset potential impacts from this project.
Mountain plover	May adversely impact individuals ²	May adversely impact individuals ²	One documented sighting and no nesting efforts in 1.0-mile analysis area over last 20+ years; no physical disturbance/loss of habitat on NFS lands; 8.6 acres physical disturbance on private surface (2% total active colony acreage in analysis area); effects minimized by timing limitations.

Table 3-5. Continued.

Evaluated Species	Impacts Determination		Justification
	No Action Alternative ¹	Proposed Action Alternative	Proposed Action Alternative
Northern harrier	May adversely impact individuals ²	May adversely impact individuals ²	No documented nesting efforts in project area over last 20+ years; few sightings in area; effects minimized by timing limitations.
American peregrine falcon	May adversely impact individuals ²	May adversely impact individuals ²	Extremely limited use of project area by foraging birds; no impact to nest sites; increased risk of vehicular collisions; effects minimized by timing limitations.
Bald eagle	May adversely impact individuals ²	May adversely impact individuals ²	Limited use of project area by foraging birds; no physical impact to nests or winter roost sites; increased risk of vehicular collisions; effects minimized by timing limitations; visual barriers present between project area and historic winter roost sites.
Loggerhead Shrike	May adversely impact individuals ²	May adversely impact individuals ²	No documented nesting efforts; few sightings in area; limited suitable nesting habitat; effects minimized by timing limitations.
Long-billed curlew	May adversely impact individuals ²	May adversely impact individuals ²	No documented nesting efforts; few sightings in area; effects minimized by timing limitations.
Brewer's sparrow	May adversely impact individuals ²	May adversely impact individuals ²	Presumed nesting efforts though limited sightings in area; moderate suitable habitat; effects minimized by timing limitations.
Reptiles/Amphibians			
Northern leopard frog	May adversely impact individuals ²	May adversely impact individuals ²	Limited disturbance to habitat during low flow; use of appropriate culverts to maintain post-construction habitat connectivity and prevent down-cutting and head-cutting.
Fish			
Plains minnow	May adversely impact individuals ²	May adversely impact individuals ²	Limited disturbance to habitat during low flow; use of appropriate culverts to maintain post-construction habitat connectivity and prevent down-cutting and head-cutting.
Flathead chub	May adversely impact individuals ²	May adversely impact individuals ²	Limited disturbance to habitat during low flow; use of appropriate culverts to maintain post-construction habitat connectivity and prevent down-cutting and head-cutting.

¹ Impacts under the No Action alternative will be due to implementation of previously permitted mining operations and other energy projects, as well as non-energy activities in the area.

² May adversely impact individuals but not likely to cause a trend to federal listing or loss of viability within the planning area.

³ CCAA/CCA = Candidate Conservation Agreement with Assurances/Candidate Conservation Agreement; voluntary, large scale conservation program under development in collaboration with the USFWS and federal land management agencies in northeast Wyoming, including the TBNG.

Environmental Consequences (Effects Analysis)

As noted, a summary of the determinations of effects under each alternative and their primary justifications are listed in Table 3-5 for each evaluated species.

Alternative 1: No Action

Under the No Action alternative, the existing alignments of the Mackey County Road and the directly adjoining segment of the Temporary Reno Road will be retained, and no new road construction will occur. Mining will not occur under the approximately 6.1 miles of the existing Mackey County Road and 2.2 miles of existing Temporary Reno Road within the NARM permit area.

Most of the 22 sensitive species evaluated either have not been documented in the analysis area, or occur seasonally or infrequently. Any species present are currently subject to injury or loss due to predation (avian and/or mammalian), collision with vehicles on existing roads, and/or current recreational shooting of prairie dogs in limited portions of the analysis area. As those impacts are already present, selection of the No Action alternative will not reduce or eliminate existing risks to these species.

The No Action alternative will not conflict with the current TBNG LRMP, or any future objectives to manage the TBNG for 21 of the 22 sensitive species evaluated. Sage-grouse are discussed separately, below.

Sage-grouse

Only two of the six leks within the 4.0-mile analysis area are still active. Five of the six lek sites are within the existing permit area for one or more mines and, therefore, are already subject to mine related disturbance regardless of actions taken on this proposal. Four of those five sites have already been eclipsed by mine operations and disturbance at the fifth lek is imminent, even under the No Action alternative. The active Tracy Waterhole lek is on private surface, and is the only one of the six leks in the analysis area that is located beyond a current mine permit boundary. However, this lek is currently exposed to regular disturbance from road traffic on a scoria oil field road located within 100 yards and in view of the lek. Per USFS standards, surface disturbance on NFS lands within 2.0 miles of active leks occurs only during the non-breeding season, regardless of whether or not the lek itself is on NFS lands.

Due to the presence of previous, existing, or imminent disturbance near all sage-grouse leks in the analysis area, implementation of the No Action alternative will not preclude additional short- or long-term effects on individuals or suitable habitat (occupied and unoccupied) in that area. The No Action alternative also will not delay or decrease the magnitude of those impacts within the Geographic Area or elsewhere in the TBNG. Furthermore, due to the downward trend of sage-grouse populations throughout the TBNG, even this alternative could conflict with the current TBNG LRMP or future objectives to manage the area for sage-grouse unless appropriate conservation and/or mitigation measures are implemented. The timely implementation of those measures, along with additional voluntary conservation measures being implemented by PPRM and adjacent mines (described under *Cumulative Effects*, below), will sufficiently reduce overall

impacts to maintain a viable population within the planning area. More details regarding impacts on sage-grouse and their habitat are provided in Section 3.4.3 (*Management Indicator Species*) of this document.

Alternative 2: Proposed Action

Brief discussions of the status, distribution, and local occurrence of each evaluated species, as well as the potential direct and indirect effects are presented in the wildlife BA/BE for the Mackey Road Relocation project, on file with the Douglas Ranger District. As noted, a summary of the determinations for the 22 evaluated sensitive species and the justification for those determinations are presented in Table 3-5.

Suitable habitats for each of the 22 analyzed sensitive species occur within the analysis area, though the locations and/or extent of such habitats, including whether or not such habitat is occupied, vary widely by species. Direct loss of, or injury to, individuals residing within the project area could result from vehicle collisions from equipment associated with road construction or post-construction use by the general public. Additional direct effects could result from collision with new fence lines that might be built in previously undisturbed flight paths and/or use of new travel corridors by mammalian predators.

As described above, the proposed right-of-way primarily traverses common upland and non-wooded habitats. The construction phase of the proposed project will occur during the non-breeding season and be completed in approximately 5 months. Construction activities and post-construction travel will be restricted to a narrow corridor that follows existing roads or two-tracks along much of its route. However, those activities will result in altered and/or fragmented habitats (breeding, roosting, and/or foraging) either not currently subject to such disturbance or not currently exposed to the levels expected to occur upon completion of the project. Although such disturbances will occur along or near existing roads and two-tracks, the new road alignment will be considerably wider and result in increased levels of traffic, noise, and dust along its route both during and after construction. The introduction of invasive and/or weedy plant species is also possible as equipment and other vehicles enter the project area during construction, operation, or maintenance of the new road. In addition to increased vehicular traffic, greater public access to NFS lands post-construction will likely lead to an increase in year-round recreational activities such as hiking and hunting that could be disruptive to any USFS sensitive species nesting or foraging in the area.

The timing of the project during the non-breeding season will minimize potential impacts on most species and their habitats during construction, but will not alleviate such impacts, especially long-term impacts associated with the final right-of-way. Reclamation of disturbed areas outside the final right-of-way will occur upon completion of construction, and will eventually replace foraging and other potential habitats for several species. However, restoration of sagebrush habitats could take decades to achieve. Required mitigation measures and additional voluntary conservation measures will further minimize potential impacts to sensitive vertebrate species.

Under the Proposed Action, the direct and indirect effects on each species will be minimized by the following factors:

1. the timing of the project during the non-breeding season (approximate 5-month completion schedule);
2. the relatively limited maximum acreage of surface disturbance on NFS lands:
 - a. 292.7 short-term acres within a 300-to-700-foot-wide corridor, and
 - b. 85.7 long-term acres within a 100-foot corridor;
3. the location of portions of the new right-of-way within existing disturbance corridors;
4. the use of existing roads and two-tracks to access the construction area;
5. the primarily upland habitats in the project area;
6. the documented lack of some species of concern during long-term (1994 through 2013, or longer) annual monitoring in the majority of the analysis area;
7. the use of appropriate erosion control and culvert structures designed to minimize erosion and maintain post-construction habitat connectivity, respectively;
8. the use of dust control measures during construction;
9. control of weeds and invasive species during and after construction;
10. use of appropriate best management practices to prevent introduction of aquatic invasive species;
11. required reclamation of disturbed areas outside the final road alignment;
12. additional required mitigation measures for impacts on sage-grouse; and
13. the continuous nature of the road once it is completed (allowing for acclimation).

These factors apply regardless of the species. Additional mitigation measures will be required for sage-grouse, which are described under that subheading.

Sage-grouse

Direct loss of, or injury to, individual sage-grouse residing within the project area could result from vehicle collisions from equipment associated with road construction or post-construction use by the general public. Additional direct effects could result from collision with new fence lines that might be built in previously undisturbed flight paths and/or use of new travel corridors by mammalian predators.

No grouse leks will be physically disturbed under the Proposed Action, either on or off NFS lands. The Tracy Waterhole lek is the nearest active sage-grouse lek to proposed disturbance. That lek is currently exposed to periodic oil and gas traffic on the scoria road approximately 100 yards west of the lek. The proposed construction corridor (project area) is approximately 0.6 mile west and beyond view of the Tracy Waterhole lek, which is beyond the USFS surface occupancy buffer distance (0.25 mile). The active Payne lek is approximately 3.8 miles west and beyond view of the project area. That lek is currently exposed to existing oil production, road traffic, and encroaching mine operations. Per USFS standards, surface disturbance on NFS lands within 2.0 miles of active leks occurs only during the non-breeding season, regardless of whether or not the lek itself is on NFS lands.

Despite these considerations, grouse and grouse habitat will be affected under the Proposed Action. As noted, the project will disturb approximately 292.7 short-term acres (i.e., during construction) and 85.7 long-term acres (new infrastructure and post-construction maintenance) on NFS lands. The latter total will be within the final 100-foot right-of-way for the relocated road. Much of the disturbance corridor will follow or be near existing roads and two-tracks,

though the new right-of-way corridor will be considerably wider than current road conditions and designed to accommodate two-way traffic when finished. Suitable sage-grouse habitat does not occur along the entire length of the proposed construction corridor. However, construction activities and post-construction use of the relocated road will result in altered and/or fragmented sage-grouse habitats either not currently subject to such disturbance or not currently exposed to traffic levels expected to occur upon completion of the project. The introduction of invasive and/or weedy plant species is also possible as equipment and other vehicles enter the project area during construction, operation, or maintenance of the new road. Increased levels of dust and noise also are likely to result from the project, both during and after construction. In addition to increased vehicular traffic, greater public access to NFS lands post-construction will likely lead to an increase in year-round recreational activities such as hiking and hunting that could be disruptive to any sage-grouse nesting or foraging in the area.

The timing of the project during the non-breeding season will minimize potential impacts on sage-grouse and their habitats during construction, but will not alleviate potential long-term impacts of increased traffic, habitat fragmentation, and public access associated with the final right-of-way. Additional details regarding potential impacts under the Proposed Action are described in Section 3.4.3 (*Management Indicator Species*) of this document. Descriptions of required mitigation measures to offset impacts to sage-grouse are provided under *Required Mitigation*, below. Timely implementation of these mitigation measures in suitable habitat on- and off-site within the TBNG, along with additional voluntary conservation measures being implemented by PPRM and adjacent mines as part of the ongoing CCAA/CCA development, will sufficiently reduce overall impacts to maintain a viable population within the planning area.

Cumulative Effects for the Proposed Action

Cumulative impacts are defined under the NEPA process as the incremental impacts of past, present, and reasonably foreseeable future actions, including the proposed action, conducted by any entity (federal, state, private, etc.). Due to the continuation of previously approved operations, implementation of either the Proposed Action or No Action alternative could contribute to cumulative impacts for all evaluated USFS Region 2 sensitive species (TBNG), though to varying degrees.

General short- and long-term cumulative effects under the Proposed Action are the same as those described for federally listed species, above, with disturbances arising from multiple sources currently present or potentially occurring on lands within the Mackey Road Relocation analysis area. Examples of such disturbances include, but are not limited to, energy projects, transportation infrastructure, utility and communication lines, grazing, and various forms of recreation. Minerals extraction is expected to increase in portions of the analysis area within the reasonably foreseeable future. Disturbances such as pipelines, power lines, roads, and facilities tend to fragment or reduce the effectiveness of remaining habitats within the vicinity of development. In addition, these activities often result in increased noise and dust levels, new long-term or permanent facilities, potential introduction of invasive and/or weedy plant species, and a generally increased human presence, among others. Factors such as drought, the appearance of new diseases, and changes in the local fire regime also can compound cumulative impacts. An incremental loss of wildlife habitat will occur in the general vicinity as a result of

several of these factors, with some wildlife species affected until reclaimed habitats are established in disturbed areas outside permanent rights-of-way or plant succession restores areas affected by natural causes such as fire or drought. A total of 85.7 additional acres of long-term disturbance on NFS lands will occur under the Proposed Action.

For TBNG sensitive species, the overall result of implementing either alternative for the proposed project will be that some individuals may be lost (Table 3-5). For most species, cumulative impacts are not expected to significantly reduce the size or viability of either their local populations or the Grassland-wide populations. Neither the Proposed Action nor the No Action alternative will conflict with the current TBNG LRMP, or any future objectives to manage the TBNG for 21 of the 22 sensitive species evaluated. However, due to cumulative impacts, both project options are likely to result in a trend to federal listing or loss of viability in the planning area for sage-grouse on the TBNG. Consequently, sage-grouse are discussed separately, below.

Specific cumulative impacts on sensitive species have been analyzed by habitat associations; additional details of those analyses are provided in the supporting wildlife BA/BE for this project, on file with the Douglas Ranger District. Mixed sagebrush-grasslands, upland grasslands (including prairie dog colonies), and limited aquatic and wetland resources occur within the proposed project area; the majority of project-related disturbances will occur in upland grassland habitats. Only a small (8.6 acres) portion of one active prairie dog colony falls within the project area (construction corridor) itself; that colony is on private surface. That acreage represents approximately 2% of the total acreage of active colonies within the surrounding 1.0-mile analysis area. A total of 0.15 acre of USACOE jurisdictional wetlands will be disturbed within the construction corridor; that disturbance will be mitigated at a 1:1 ratio adjacent to the disturbed site (see *Wetlands* subsection under Section 3.7, *Hydrology*). Few, if any, trees will be disturbed in the project area, though cottonwoods and pine breaks are present along the two primary creeks and on some ridges along the proposed right-of-way.

Sage-grouse

As noted under the discussion of federally listed species, the analysis area encompasses both occupied and unoccupied sage-grouse habitat. Long-term telemetry data in the vicinity have documented that sage-grouse use is concentrated in the central portion of the analysis area. While impacts can and have occurred in many places across the TBNG, some areas continue to provide suitable, occupied sage-grouse habitat that serves the region as a whole.

Nevertheless, cumulative impacts are expected to cause a direct loss or degradation of seasonal or year-round sage-grouse habitats, including long-term impacts in all habitat types found within existing and pending mine permit boundaries. Disturbances such as pipelines, power lines, roads, and other infrastructure tend to fragment or reduce the effectiveness of remaining habitats within the vicinity of development. Noise, increased human presence, new fence construction, increased predation (from wildlife and domestic pets), introduction of invasive and/or weedy plant species, and/or changes in fire regimes often accompany these types of development. The additional and synergistic impacts from other factors including, but not limited to, drought, disease, grazing, off-road vehicle use, and other forms of recreation also continue to adversely

impact year-round sage-grouse habitat, especially sagebrush stands and nearby aquatic habitats (potential brood rearing habitat).

Per USFS standards, surface disturbance on NFS lands within 2.0 miles of active leks occurs only during the non-breeding season, regardless of whether or not the lek itself is on NFS lands. Energy extraction activities have requirements for reclamation of disturbed sites as areas are altered and resources are depleted. These restrictions and requirements will help mitigate future habitat losses, although the full benefits from reclaimed sagebrush stands will not be realized for many years, possibly decades, after the reclamation or decommissioning phases of the projects. Habitat losses due to rural housing developments should be considered permanent. As with all lands administered on the TBNG, further consolidation of lands through land exchange will occur as opportunities arise.

Ongoing and previously permitted surface disturbance will continue in the analysis area regardless of whether or not the proposed project is approved. Therefore, precluding the project by selection of the No Action alternative will not eliminate additional short- or long-term effects on sage-grouse habitat, sage-grouse population viability, or the distribution of sage-grouse across the TBNG. However, the timely implementation of required mitigation measures (see below) in suitable habitat on- and off-site within the TBNG, along with additional voluntary conservation measures being implemented by PPRM and other local mines as part of the ongoing CCAA/CCA development, will sufficiently reduce overall impacts to maintain a viable population within the planning area. More details regarding impacts on sage-grouse and their habitat are provided in Section 3.4.3 (*Management Indicator Species*) of this document.

Determination of Effects and Rationale for Sensitive Species

The No Action alternative **may impact individuals but not likely to cause a trend to federal listing or loss of viability in the planning area** for 21 of the 22 evaluated Region 2 (TBNG) sensitive species.

Sage-grouse

Without mitigation, both the Proposed Action and No Action alternative are likely to result in a trend to federal listing or loss of viability in the planning area for sage-grouse on the TBNG. Impacts from existing activities, natural factors, and changes in timing and/or severity of natural events due to human influences will continue under either alternative. Long-term telemetry data have documented that sage-grouse use limited portions of the analysis area, including lands near the proposed road corridor in some locations. Impacts such as increased levels of traffic, noise, dust, permanent infrastructure, human presence, and potential use of new travel corridors by mammalian predators will occur both during and after construction. Impacts from all of these factors will have both short- and long-term effects on sage-grouse habitat, sage-grouse population viability, and the distribution of sage-grouse across the TBNG.

However, the timely implementation of mitigation measures in suitable habitats on- and off-site within the TBNG, along with additional voluntary conservation measures being implemented by PPRM and other local mines as part of the ongoing CCAA/CCA development throughout the region, will sufficiently reduce overall impacts to maintain a viable sage-grouse population

within the planning area. Therefore, the Proposed Action and No Action alternative **may impact individuals but not likely to cause a trend to federal listing or loss of viability in the planning area.**

Required Mitigation

The following mitigation measures will be required under the Proposed Action. During road construction, PPRM will be required to mitigate on-site impacts through the use of dust suppression methods and materials, and to adhere to timing restrictions (i.e., USFS Standards) designed to protect active lek sites. Reclamation of newly disturbed areas beyond the final right-of-way will occur upon completion of construction, and will be accomplished using appropriate methods and seed mixes. The company may voluntarily choose to continue dust suppression for some time post-construction as a good faith effort.

PPRM also will be required to implement off-site mitigation measures in appropriate sage-grouse habitat elsewhere on the TBNG before, during, or after construction. Such measures could include, but are not limited to: cheatgrass treatments, weed control, conifer removal in sagebrush habitats, shrub removal in drainages (i.e., brood-rearing habitat) through mowing, water development or enhancement in brood-rearing habitats, windmill removals in favor of solar power, or other measures identified collaboratively by PPRM and the USFS as beneficial to sage-grouse.

Monitoring

Results from continued annual surveys will be used by the USFS to determine whether or not additional Standards or Guidelines should be applied to the project. Routine monitoring post-construction will occur as part of the National Grasslands' monitoring program and in areas overlapping the annual survey perimeters for nearby coal mines.

In addition, to help protect Region 2 sensitive species, the USFS may ask that the operator notify the District Ranger, Douglas Ranger District if a sensitive species' nest or den, other than those already identified, is located during construction or operation of the project. The District Ranger, Douglas Ranger District also may ask for future surveys to be conducted for any Region 2 sensitive species. This will allow assessments of how, and if, implementation of the Grassland Plan is benefiting these species.

3.4.3 Management Indicator Species (MIS)

A Management Indicator Species (MIS) is defined as a "plant or animal species or habitat components selected in a planning process used to monitor the effects of planned management activities on populations of wildlife and fish, including those that are social or economically important" (USFS 2002). Management indicator species are selected to serve as barometers for species diversity and viability. These species are monitored over time to assess the effects of management activities on their populations and habitat, and the populations of other species with similar habitat needs. The MIS for the TBNG are identified by Geographic Area.

The majority of the proposed project is within the Hilight Bill Geographic Area. Approximately 1.6 miles of the construction corridor will cross NFS lands in the Broken Hills Geographic Area; 1.2 miles along the central portion of the route and 0.4 mile near its southern extent. Disturbance in that geographic area will affect approximately 60.0 non-contiguous acres. As a result, the Mackey Road Relocation project has two MIS: the sage-grouse and black-tailed prairie dog (USFS 2002, Chapter 2). The sage-grouse is identified for both the geographic areas, whereas the prairie dog is selected only in the Broken Hills Geographic Area.

Existing Conditions

Black-tailed Prairie Dog

No black-tailed prairie dog colonies are present in the portions of the analysis area that overlap the Broken Hills Geographic Area: T42:R69, Section 21 and northeast Section 33. Therefore, no impacts to this MIS will occur in that geographic area. Consequently, the sage-grouse is the only MIS discussed for the remainder of this section. Refer to the previous sections of this document for descriptions of prairie dog occurrence in the project area and the potential impacts of the proposed project on this species.

Sage-grouse

The sage-grouse is selected as a MIS for sagebrush habitats that have tall, dense, and diverse herbaceous understories (USFS 2002). This species generally does not respond positively to human activities and disturbances. The decline in sage-grouse populations across its range has been attributed, in part, to a loss in habitat or its function, and increased human disturbances during critical periods of its life cycle. These periods include breeding, nesting and, in some cases, during stressful times due to winter conditions (USFS 2002).

Management Direction

The TBNG LRMP identifies specific Objectives for the management of habitat for sage-grouse, as well as Standards and Guidelines to guide management activities on NFS lands. The Grassland-wide direction that applies to the Proposed Action (Mackey Road Relocation) is outlined in detail in Chapter 1 of the Plan, on pages 1-18 and 1-19 (Sage-grouse), 1-29 (Section P: Special Uses), and to 1-30 (Section Q: Infrastructure Use and Management). Objectives, Standards, and Guidelines for sage-grouse specific to the Broken Hills Geographic Areas can be found in Chapter 2 of the LRMP (USFS 2002: pages 2-5 and 2-8). Such information for the Hilight Bill Geographic Area is found in Chapter 2, pages 2-23 and 2-24 (USFS 2002). All Objectives, Standards, and Guidelines applicable to the Mackey Road Relocation project are outlined in Appendix 1 of this document.

Habitat

Sage-grouse are found in sagebrush-grassland habitats throughout northeast Wyoming (WGFD 2009). Occupied habitat is fairly contiguous from the Bighorn Mountains east to the Black Hills and the Wyoming-Nebraska state line, with the exception of forested, grassland, and highly developed agricultural lands. Sage-grouse have been documented as year-round residents of the TBNG. They are primarily associated with sagebrush shrub-land habitats, with some use of adjacent habitats for movement and minimal foraging. Sagebrush is essential for sage-grouse throughout the year. This relationship is perhaps tightest in the late fall, winter, and early spring when sage-grouse are dependent on sagebrush for both food and cover. During late spring and summer, succulent forbs and insects become important additional food sources. Sage-grouse require an extensive mosaic of habitats dominated by sagebrush of varying densities and heights along with an associated diverse native plant community dominated by high levels of native grasses and forbs (Wyoming Greater Sage Grouse Conservation Plan 2003).

Sagebrush habitats have been identified as a key habitat. Brown and Clayton (2004) stated that “Within the southern Powder River Basin, moderately dense sagebrush was relatively uncommon (approximately 7%). Dense sagebrush was very limited (about 0.5%).” The USFS currently estimates that approximately 438,000 acres of potential sage-grouse habitat (sagebrush and grassland mixture) is currently available to grouse on the TBNG (USFS 2002, Appendix H). As stated, the majority of the Mackey Road Relocation project is within the Hilight Bill Geographic Area. More than half of that geographic area is considered potentially suitable sage-grouse habitat; some of those acres fall within the analysis area for the project. A smaller proportion of the Broken Hills Geographic Area is considered potentially suitable; that area is comprised primarily of rolling hills and steep escarpments, with a mix of upland grasslands, sagebrush, pine breaks, and prominent drainage systems. With the exception of those areas that have been disturbed as a part of coal mining operations, the USFS will consider all sagebrush communities within the analysis area as potentially suitable sage-grouse. Additional sage-grouse habitat can be found in small grassland openings, intermingled meadows, wetlands, and drainages next to sagebrush, where breeding and brood-rearing occur. It is assumed that the percentages of both moderately dense and dense sagebrush stands found on the TBNG and within the analysis area are relatively consistent with overall stand conditions throughout the PRB.

Quality nesting habitat is described as a sagebrush stand with 15 to 25% canopy cover of sagebrush and a tall and dense understory of native grasses and forbs. The tallest sagebrush available on Wyoming sites is reported as being preferred for nesting in western Wyoming, though those parameters may not apply in the northeastern part of the state. These sites are generally in larger stands with patches of taller (16 – 32 inches), denser (up to 35% canopy cover) sagebrush interspersed throughout the stand and where no more than 25% of the stand is comprised of small openings. Tall (greater than 7 inches) and dense residual herbaceous cover of native grasses and forbs from the previous growing season provides the cover available at the onset of the nesting season when most nest sites are selected and egg-laying and incubation begin (USFS 2002). Most nests are within 2.0 to 4.0 miles of display grounds.

Results from the long-term annual monitoring and telemetry study have demonstrated that sage-grouse use of the project area has been concentrated in the central portion of the Mackey Road Relocation project area (i.e., construction corridor) and 4.0-mile analysis area since at least 2001. However, the quality of available sagebrush habitat varies widely throughout the area, ranging from heavily grazed, sparse sagebrush stands with little residual grasses to moderately dense stands of sagebrush intermingled with good quality residual grasses. Although some sagebrush is present, the western quarter of the analysis area is dominated by upland grassland communities, particularly in the southwestern corner. Consequently, the analysis area consists of both occupied and unoccupied habitat.

Existing land uses on both federal and non-federal lands in the analysis area include open pit coal mining, oil and gas (conventional and CBNG) developments, livestock grazing (both cattle and sheep), required annual wildlife monitoring and mitigation measures, and limited recreation. Oil and gas development and livestock grazing are currently the most prevalent land uses in the area, though the NARM coal pit is encroaching from the south and another mine will encroach from the north. All of those activities are permitted, and are expected to continue in the future.

Populations

Project Area and Analysis Area

The individual histories of all sage-grouse leks found within the analysis area since monitoring began are thoroughly described in annual reports for NARM, on file with the Douglas Ranger District and WDEQ in Sheridan or Cheyenne, Wyoming. Two active sage-grouse leks are present within 4.0 miles of the project area: Payne and Tracy Waterhole. Four inactive lek sites are also present in that analysis area: Rochelle, Wilson, Kort I, and Kort II. The USFS defines active leks as having attending males present during at least 1 of the most recent 5 years, whereas inactive leks have not had attending males present in the most recent 5-year period (USFS 2002, page 1-18). This is in contrast to the WGFD lek management status definitions, which extend out to a 10-year assessment period. Because the project affects NFS lands, the USFS definitions are used for this analysis.

Peak male counts conducted by USFS and non-agency biologists at all leks in the analysis area have indicated that overall sage-grouse numbers in the Rochelle lek complex (five of the six leks) and the nearby the Tracy Waterhole lek have been highly variable since the first lek was discovered in that area in 1975. Peak male counts at both active leks also have been low over time, with an average of approximately 7 males per year at the Payne lek and 14 males per year at the Tracy Waterhole lek since their respective discoveries. Peak male counts have declined at both sites over the last few years (pre-disturbance). Displaying males were observed only at the Tracy Waterhole lek in 2012 and 2013, though males were seen approximately 1.25 miles north of the Payne lek in 2013. Hens were confirmed at both leks either visually or via telemetry in both years.

As noted, all other leks in the analysis area are inactive by USFS classification, with no grouse attendance during the last 5 years. Grouse were last documented at the Rochelle lek in 1999, and

it was disturbed by mining activities in 2004. The Wilson and Kort leks were last active in 1997, 2004, and 2006, respectively. The Wilson and Kort II leks were disturbed by mine operations in 2011, and the Kort I lek was disturbed by mine activities in 2012. All mine related disturbance at and within 2.0 miles of these leks occurred during the non-breeding season to minimize potential impacts on breeding or nesting grouse.

Grassland-wide and Geographic Area

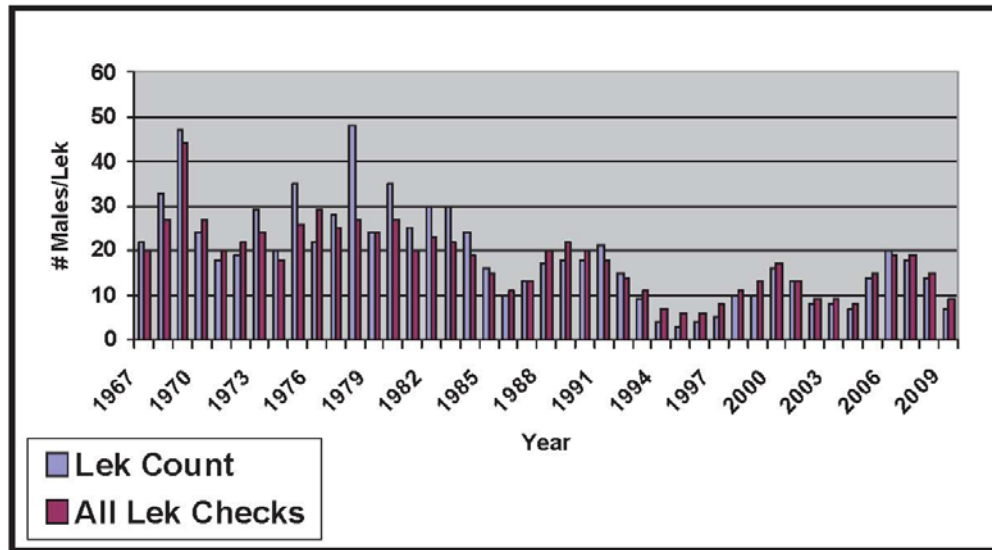
Sagebrush habitats in northeast Wyoming are less continuous than in the western part of the state, which contributes to lower sage-grouse densities in the northeast (WGFD 2009). Northeast Wyoming has the lowest average male lek attendance in the state, averaging 9 males per active lek in 2009 compared to the statewide average of 25 males per active lek that year; that is the most current compiled data available from the WGFD. Most leks in northeast Wyoming are small, with peak counts of less than 20 males. Less than 10% of those leks have peak counts greater than 50 males (WGFD 2009).

The average number of males/active lek for all monitoring (counts and surveys) combined from 1967 through 2009 (most current data available) for the Northeast Wyoming Working Group Area is shown in Figure 3-1 (WGFD 2009). Assuming the average number of males/active lek is reflective of the sage- grouse population, the trend suggests about a 10-year cycle of periodic highs and lows. With the exception of the most recent cycle, the trends show a concerning pattern of peaks and periodic lows in average male attendance usually being lower than the previous level in both cases. Consequently, the long term trend suggests a steadily declining sage-grouse population (WGFD 2009). Recent fluctuations, including periods of increase, in population trends are believed to be largely weather-related. Timely precipitation in some years resulted in improved habitat conditions, allowing greater numbers of sage-grouse to hatch and survive. Conversely, multi-year drought conditions are believed to have caused lower grouse survival in the early 2000s, leading to population declines during that period. Long-term trends for the number of males/active lek on the TBNG have been similar to the statewide and northeast Wyoming trends, though TBNG counts have been consistently lower than those in the other two regions (Figure 3-2). The statewide and regional patterns are important relative to the TBNG because that area is a part of these larger data sets.

In 2012 and early 2013, the USFS reevaluated sage-grouse viability on the TBNG. During the period from 1996 through 2012, the minimum sage-grouse population estimate has been highly variable but has shown a consistent downward trend since 2007 (Figure 3-3). The population estimate was below the 10-year mean from 2003 through 2005. After a brief rebound, it fell below the mean again in 2009 and has continued to decline in each subsequent year.

The declines in sage-grouse populations on the TBNG over time are likely related to a variety of factors, alone or in combination, such as: major shifts in land use; increased presence of invasive and weedy plant species and associated changes in fire regime; increased presence of vertical structures such as utility, wind power, and communication infrastructure; increased habitat loss from rural subdivision; and natural causes such as drought and wildfire. These factors have

Figure 3-1. Northeast Wyoming Local Working Group Area males lek attendance from 1967 through 2009.



Northeast Wyoming Working Group 2008 Annual Sage-Grouse Completion Report (WGFD 2009, most current available through spring 2013)

Figure 3-2. Mean number of males/lek counted at active sage-grouse leks for all of Wyoming, northeast Wyoming, and on the TBNG from 1996 through 2011.

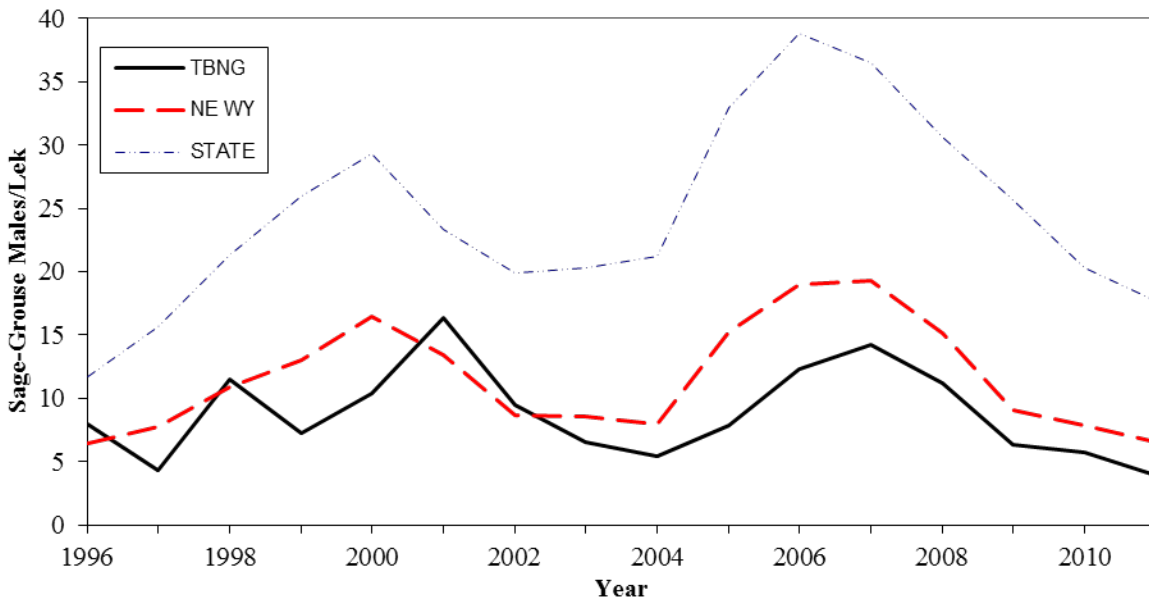
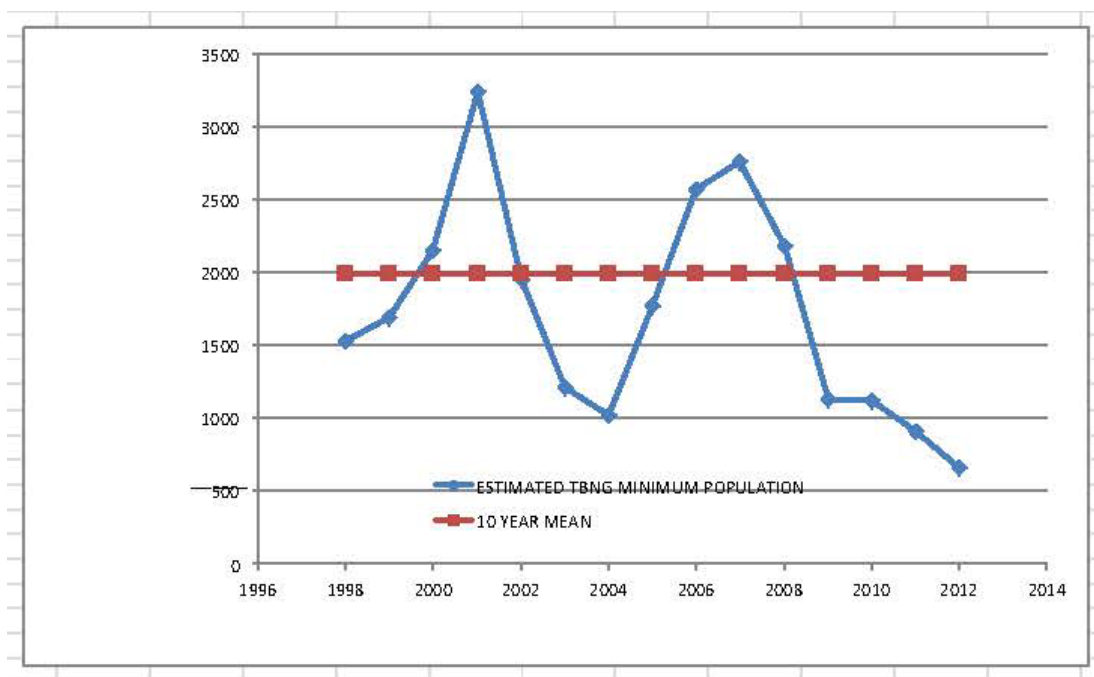


Figure 3-3. Minimum sage-grouse population estimates and 10-year mean for the TBNG from 1996 through 2012.



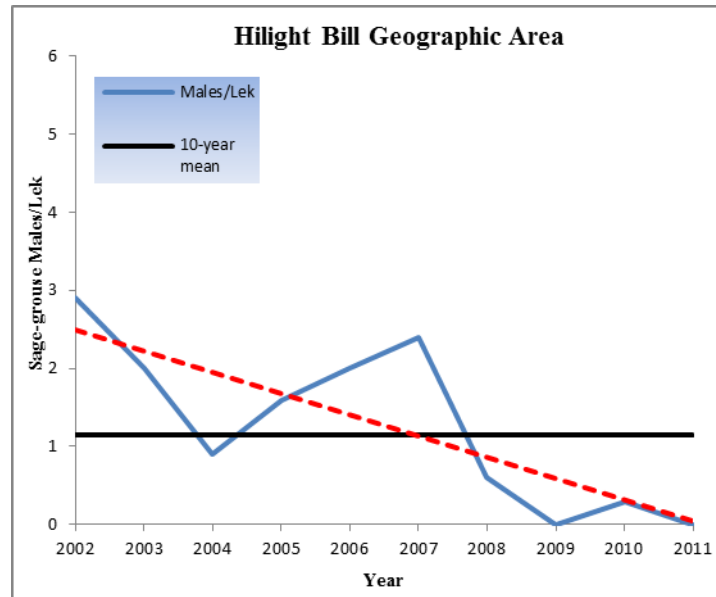
combined to result in the loss, fragmentation, or degradation of sagebrush habitats that have compromised the large blocks of habitat necessary to sustain sage-grouse.

Hilight Bill and Broken Hills Geographic Areas

As stated, the majority of the Mackey Road Relocation project is within the Hilight Bill Geographic Area. More than half of that geographic area is considered potentially suitable sage-grouse habitat; some of those acres fall within the analysis area for the project. A smaller proportion of the Broken Hills Geographic Area is considered potentially suitable; that area is comprised primarily of rolling hills and steep escarpments, with a mix of upland grasslands, sagebrush stands, pine breaks, and prominent drainage systems. With the exception of those areas that have been disturbed as a part of coal mining operations, the USFS will consider all sagebrush stands within the analysis area as potentially suitable sage-grouse. Additional sage-grouse habitat can be found in small grassland openings, intermingled meadows, wetlands, and drainages next to sagebrush, where breeding and brood-rearing occur. It is assumed that the percentages of both moderately dense and dense sagebrush stands found on the TBNG and within the analysis area are relatively consistent with overall stand conditions throughout the PRB.

Only six sage-grouse leks have been documented on NFS lands within the entire Hilight Bill Geographic Area. Four of those leks are classified as abandoned or destroyed due to activity associated with local surface coal mines. The average number of male grouse per lek from 2008 through 2011 was lower than in all previous years (Figure 3-4). This declining trend has

Figure 3-4. Sage-grouse males per lek and 10-year mean for the Hilight Bill Geographic Area from 2002 through 2011.



occurred since before 2002. However, it is worth noting that counts rarely exceeded five males per lek during that period, indicating that this geographic area may not be a stronghold for grouse; that likelihood has also been acknowledged by the WGFD (2009). In 2009, two leks were still considered active on NFS lands in this Geographic Area. Recent data for the Broken Hills Geographic Area is available from the Douglas Ranger District.

Environmental Consequences (Effects Analysis)

Alternative 1: No Action

Direct and Indirect Effects on Habitat in the Project Area

Under the No Action alternative, the existing alignments of the Mackey County Road and the directly adjoining segment of the Temporary Reno Road will be retained, and no new road construction will occur. Mining will not occur under the approximately 6.1 miles of the existing Mackey County Road and 2.2 miles of existing Temporary Reno Road within the NARM permit area.

Only two of the six leks within the 4.0-mile analysis area are still active. Five of the six lek sites are within the existing permit area for one or more mines and, therefore, are already subject to mine related disturbance regardless of actions taken on this proposal. Four of those five sites have already been eclipsed by mine operations and disturbance at the fifth lek is imminent, even under the No Action alternative. The active Tracy Waterhole lek is on private surface, and is the only one of the six leks in the analysis area that is located beyond a current mine permit

boundary. However, this lek is currently exposed to regular disturbance from road traffic on a scoria oil field road located within 100 yards and in view of the lek. Per USFS standards, surface disturbance on NFS lands within 2.0 miles of active leks occurs only during the non-breeding season, regardless of whether or not the lek itself is on NFS lands.

Due to the presence of previous, existing, or imminent disturbance near all sage-grouse leks in the analysis area, implementation of the No Action alternative will not preclude additional short- or long-term effects on individuals or suitable habitat (occupied and unoccupied) in that area. The No Action alternative also will not delay or decrease the magnitude of those impacts within the Geographic Area or elsewhere in the TBNG. Furthermore, due to the downward trend of sage-grouse populations throughout the TBNG, even this alternative could conflict with the current TBNG LRMP or future objectives to manage the area for sage-grouse unless appropriate conservation and/or mitigation measures are implemented. The timely implementation of those measures, along with additional voluntary conservation measures being implemented by PPRM and adjacent mines (described under *Cumulative Effects*, below), will sufficiently reduce overall impacts to maintain a viable population of sage-grouse within the planning area.

Alternative 2: Proposed Action

The Proposed Action will result in approximately 292.7 acres of short-term surface disturbance on NFS lands during construction, and approximately 85.7 acres of permanent disturbance (new infrastructure and post-construction maintenance) on NFS lands upon completion and transfer of the road easement to Campbell County. Surface disturbance and post-construction reclamation efforts associated with this project were thoroughly described in Section 2.1.2 of this document.

Direct and Indirect Effects on Habitat within the Project Area

Long-term telemetry information indicates that both occupied and unoccupied sage-grouse habitat (sagebrush) is present in the 4.0-mile analysis area. Habitat quality varies widely throughout the area. Sagebrush stands range from sparse with little residual grasses, to moderately dense stands of sagebrush intermingled with good quality residual grasses. No sage-grouse leks will be physically disturbed under the Proposed Action, either on or off NFS lands. The Tracy Waterhole lek is the nearest active lek to proposed disturbance. That lek is currently exposed to periodic oil and gas traffic on the scoria road approximately 100 yards west of the lek. The proposed construction corridor (project area) is approximately 0.6 mile west and beyond view of the Tracy Waterhole lek, which is beyond the USFS surface occupancy buffer distance (0.25 mile). The active Payne lek is approximately 3.8 miles west and beyond view of the project area. That lek is currently exposed to existing oil production, road traffic, and encroaching mine operations. Per USFS standards, surface disturbance on NFS lands within 2.0 miles of active leks occurs only during the non-breeding season, regardless of whether or not the lek itself is on NFS lands.

Much of the disturbance corridor will follow or be near existing roads and two-tracks, though the new right-of-way corridor will be considerably wider than current road conditions and designed to accommodate two-way traffic when finished. The disturbance corridor could create new travel routes for mammalian predators. However, most of the proposed route follows existing travel lanes, so new predator corridors will be minimal. Suitable sage-grouse habitat does not

occur along the entire length of the proposed construction corridor. However, construction activities and post-construction use of the relocated road will result in altered and/or fragmented sage-grouse habitats either not currently subject to such disturbance or not currently exposed to traffic levels expected to occur upon completion of the project. The introduction of invasive and/or weedy plant species also is possible as equipment and other vehicles enter the project area during construction, operation, or maintenance of the new road. Increased levels of dust also are likely to result from the project, both during and after construction, which can impact plants near the disturbance area.

Sage-grouse use has been concentrated in the central portion of the project area over the last several years. Disturbed sagebrush stands outside the final right-of-way will be reclaimed, but it will take many years and possibly decades to restore those shrub areas to a pre-disturbance condition. Foraging conditions could be improved slightly should forbs and grasses reseed in disturbed areas, though some such areas will be located alongside the new road, which can discourage use by some birds.

The timing of the project will minimize potential impacts on sage-grouse breeding, nesting, and early brood-rearing habitats during construction, but will not alleviate impacts, especially long-term impacts associated with the final right-of-way. Descriptions of required mitigation measures to offset impacts to sage-grouse habitats are provided under Required Mitigation, below.

Direct and Indirect Effects on Individuals in the Project Area

Direct loss of, or injury to, individual sage-grouse present within the project area could result from vehicle collisions from equipment associated with road construction or post-construction use by the general public. Additional direct effects could result from collision with new fence lines that might be built in previously undisturbed flight paths and/or use of new travel corridors by mammalian predators. In addition to increased vehicular traffic and noise, greater public access to NFS lands post-construction will likely lead to an increase in year-round recreational activities such as hiking and hunting that could be disruptive to any sage-grouse nesting or foraging in the area.

Two active sage-grouse leks are present within 4.0 miles of the proposed Mackey Road Relocation project area: Payne and Tracy Waterhole. Peak male counts at the Tracy Waterhole lek (nearest to proposed disturbance) have historically been quite low, averaging approximately 14 birds per year since its discovery in 2005. Male grouse attendance at this lek were highest (22-30 males) in the first few years (2005-2008) of monitoring, though numbers began to decline by 2008. Peak male counts decreased annually each year from 2008 through 2012, when only three males were recorded; that also was the peak male count in 2013. Peak male counts at the Payne lek have averaged approximately 7 birds per year since it was first recorded in 2001. No more than two males have been seen at the Payne lek in the last 5 years (2009-2013). Birds attending those leks could be directly impacted by collisions with vehicles or new fences, predated, or deterred from using active lek sites due to increased noise from nearby traffic upon completion of the new road. Increased dust levels also could deter birds from using foraging areas near the new road corridor. As noted previously, multi-year telemetry studies have

documented that grouse have shifted some of their activities away from disturbance in the past, and it is possible that they may respond similarly to this project should they feel pressured by construction activities and resulting road traffic.

Direct and Indirect Effects and Cumulative Impacts on Habitat Trends Grassland-wide

Habitat fragmentation and increased surface disturbance due to current activities have reduced the effectiveness of existing sage-grouse habitats throughout the TBNG. Road construction and resulting mine operations west of the project area can change existing topography and fragment habitats in the vicinity. This fragmentation increases access by predators, risk of mortalities due to collisions with construction vehicles, and may increase the presence of invasive weeds, all of which can negatively impact wildlife. Although it will be minimal (85.7 long-term acres on NFS lands), the Mackey Road Relocation project will contribute to the cumulative loss of sagebrush habitat within the Hilight Bill and Broken Hills geographic areas, and the TBNG as a whole.

While impacts can and have occurred in many places across the TBNG, some areas continue to provide suitable, occupied sage-grouse habitat that serves the region as a whole. Nevertheless, cumulative impacts are expected to cause a direct loss or degradation of seasonal or year-round sage-grouse habitats, including long-term impacts in all habitat types found within neighboring mine permit boundaries. Disturbances such as pipelines, power lines, roads, and other infrastructure tend to fragment or reduce the effectiveness of remaining habitats within the vicinity of development. Noise, increased human presence, new fence construction, introduction of invasive and/or weedy plant species, and/or changes in fire regimes often accompany these types of development. The additional and synergistic impacts from other factors including, but not limited to, drought, grazing, off-road vehicle use, and other forms of recreation also continue to adversely impact year-round sage-grouse habitat, especially sagebrush stands and nearby aquatic habitats (potential brood rearing habitat).

Direct and Indirect Effects and Cumulative Impacts on Population Trends Grassland-wide

Recent population trends in the TBNG were discussed above in the *Populations* subsection of this discussion and illustrated in Figures 3-2 through 3-4. Long-term trends for the number of males/active lek on the TBNG have been similar to the statewide and northeast Wyoming trends, though TBNG counts have been consistently lower than those in the other two regions. The declines in sage-grouse populations on the TBNG over time are likely related to a variety of factors, alone or in combination, such as: major shifts in land use; increased presence of invasive and weedy plant species and associated changes in fire regime; increased presence of vertical structures such as utility, wind power, and communication infrastructure; increased habitat loss from rural subdivision; and natural causes such as drought and wildfire that have combined to result in the loss, fragmentation, or degradation of sagebrush habitats that have compromised the large blocks of habitat necessary to sustain this sage-grouse.

Summary of Effects on Grassland-wide Habitat and Population Trends as it Relates to Viability

Sage-grouse continue to remain well-distributed across the TBNG, occurring in all six Geographic Areas. The majority (96%) of the population resides outside the Hilgert Bill Geographic Area, where the bulk of the Mackey Road Relocation project will occur. However, populations are in decline throughout the TBNG, and habitat fragmentation, loss, or degradation is likely to continue or increase in the near future. The additional and synergistic impacts from other factors including, but not limited to, drought, disease, grazing, increased predation (by wild and domestic animals), off-road vehicle use, and other forms of recreation also continue to adversely impact year-round sage-grouse habitat, especially sagebrush stands and nearby aquatic habitats (potential brood rearing habitat). These habitat impacts ultimately affect sage-grouse populations.

Without mitigation, the Proposed Action is likely to result in a trend to federal listing or loss of viability in the planning area for sage-grouse on the TBNG. Long-term telemetry data have documented that sage-grouse use limited portions of the analysis area, including lands near the proposed road corridor in some locations. Impacts such as increased levels of traffic, noise, dust, permanent infrastructure, human presence, and potential use of new travel corridors by mammalian predators will occur both during and after construction. These impacts will have both short- and long-term effects on sage-grouse habitat, sage-grouse population viability, and the distribution of sage-grouse across the TBNG.

Per USFS standards, surface disturbance on NFS lands within 2.0 miles of active leks occurs only during the non-breeding season, regardless of whether or not the lek itself is on NFS lands. Energy extraction activities have requirements for reclamation of disturbed sites as areas are altered and resources are depleted. These restrictions and requirements will help mitigate future habitat losses, although the full benefits from reclaimed sagebrush stands will not be realized for many years, possibly decades, after the reclamation or decommissioning phases of the projects.

The timing of the project during the non-breeding season will minimize potential impacts on sage-grouse and their habitats during construction, but will not alleviate impacts, especially long-term impacts associated with the final right-of-way. Descriptions of required mitigation measures to offset impacts to sage-grouse are provided under *Required Mitigation*, below. Timely implementation of these measures in suitable habitat on- and off-site within the TBNG, along with additional voluntary conservation measures being implemented by PPRM and other local mines as part of the ongoing CCAA/CCA development, will sufficiently reduce overall impacts to maintain a viable population within the planning area.

Determination of Effects and Rationale for MIS

Both the Proposed Action and No Action alternative **may impact individuals but not likely to cause a trend to federal listing or loss of viability in the planning area** for black-tailed prairie dogs in the Broken Hills Geographic Area.

Sage-grouse

Without mitigation, both the Proposed Action and No Action alternative are likely to result in a trend to federal listing or loss of viability in the planning area for sage-grouse on the TBNG. Impacts from existing activities, natural factors, and changes in timing and/or severity of natural events due to human influences will continue under either alternative. Long-term telemetry data have documented that sage-grouse use limited portions of the analysis area, including lands near the proposed road corridor in some locations. Impacts such as increased levels of traffic, noise, dust, permanent infrastructure, human presence, and potential use of new travel corridors by mammalian predators will occur both during and after construction. Impacts from all of these factors will have both short- and long-term effects on sage-grouse habitat, sage-grouse population viability, and the distribution of sage-grouse across the TBNG.

However, the timely implementation of mitigation measures in suitable habitat on- and off-site within the TBNG, along with additional voluntary conservation measures being implemented by PPRM and other local mines as part of the ongoing CCAA/CCA development throughout the region, will sufficiently reduce overall impacts to maintain a viable sage-grouse population within the planning area. Therefore, the Proposed Action and No Action alternative **may impact individuals but not likely to cause a trend to federal listing or loss of viability in the planning area.**

Required Mitigation

The following mitigation measures will be required under the Proposed Action. During road construction, PPRM will be required to mitigate on-site impacts through the use of dust suppression methods and materials, and to adhere to timing restrictions (i.e., USFS Standards) designed to protect active lek sites. Reclamation of newly disturbed areas beyond the final right-of-way will occur upon completion of construction, and will be accomplished using appropriate methods and seed mixes. The company may voluntarily choose to continue dust suppression for some time post-construction as a good faith effort.

PPRM also will be required to implement off-site mitigation measures in appropriate sage-grouse habitat elsewhere on the TBNG before, during, or after construction. Such measures could include, but are not limited to: cheatgrass treatments, weed control, conifer removal in sagebrush stands, shrub removal in drainages (i.e., brood-rearing habitat) through mowing, water development or enhancement in brood-rearing habitats, windmill removals in favor of solar power, or other measures identified collaboratively by PPRM and the USFS as beneficial to sage-grouse.

Grassland Plan Compliance

As discussed within this document, the proposed project is considered to be in compliance with the current LRMP and Grassland Plan direction, and the Grassland-wide and Management Area Standards and Guidelines for wildlife (including federally endangered, threatened, candidate, regionally sensitive and Management Indicator Species). Impacts on sage-grouse will be addressed by required mitigation measures to be implemented both on- and off-site.

3.4.4 Other Wildlife Species and Habitat Considerations

Existing Conditions

Brief descriptions of other species known to occur, or potentially occurring, in the analysis area are provided below. More detailed information regarding these species is available in the supporting BA/BE for this project, on file with the Douglas Ranger District. Additional information is available in annual wildlife monitoring reports prepared for NARM and in the Wright Area Coal LBA Final EIS. Annual wildlife reports for NARM are on file with the Douglas Ranger District and WDEQ in Sheridan and Cheyenne, Wyoming. The coal EIS is available from the BLM's High Plains District Office in Casper, Wyoming.

Numerous ongoing activities are present in the analysis area, which overlaps both the Hilight Bill and Broken Hills Geographic Areas. Those activities include, but are not limited to, coal mining, conventional oil and gas production, road use, livestock grazing, and various forms of recreation (hunting, trapping, hiking, etc.). Most of those activities are expected to continue at similar levels, though the type of activities may differ between the two geographic areas. Coal mining, and oil and gas development is expected to occur at an increased rate in the future due to the growing need for domestic energy sources in the United States.

Raptors

Potential impacts on the following sensitive raptor species were addressed in Section 3.4.2 (*Sensitive Species*) of this document: bald eagle, ferruginous hawk, burrowing owl, and northern harrier. Additional raptor species identified within the 1.0-mile analysis area are the golden eagle (*Aquila chrysaetos*), red-tailed hawk (*Buteo jamaicensis*), Swainson's hawk (*Buteo swainsoni*), great horned owl (*Bubo virginianus*), merlin (*Falco columbarius*), and long-eared owl (*Asio otus*).

Overall, 31 raptor nest sites representing six different species have been identified in the project area and the 1.0-mile analysis area during overlapping raptor monitoring at nearby surface coal mines over the last 4 to 30 years (2010-2013 or 1984-2013, respectively), depending on the area. Over time, many of the nests in the survey area have been destroyed by natural causes, relocated for mine-related mitigation measures, or removed by mining. As of August 2013, 16 nests were known to be physically intact. Details regarding the location, nest substrate, and 7-year history of all 31 nest sites are provided in the supporting BA/BE for this project, on file with the Douglas Ranger District. As noted, additional information is available in the annual wildlife monitoring reports for NARM and adjacent mines. The latter reports are on file with the Douglas Ranger District in Douglas, Wyoming and WDEQ in Sheridan or Cheyenne, Wyoming.

All 31 nest sites are located outside the current coal lease area (i.e., potentially subject to USFS regulation if on NFS lands). Fifteen nest sites are on NFS lands; 7 of the 15 nests are physically intact. Only 2 of the 15 nests on NFS lands are designated as "active" according to USFS guidelines. One of the nests has been used by multiple species over time, but red-tailed hawks have been the only species using the site in the last 7 years.

Nine of the remaining 16 raptor nest sites on non-federal surface were physically intact through August 2013. Four of the 16 sites are considered active; all 4 also are physically intact.

Potential but unoccupied nesting habitat is present in trees and rough breaks spread throughout the analysis area. Trees occur as cottonwoods along School Creek and pines on scoria ridgelines.

Bats

Two of the three sensitive bat species analyzed for this project have been documented in the Mackey Road Relocation analysis area: the hoary bat and fringed myotis. The Townsend's big-eared bat has not been recorded in that area. No known bat roost sites, maternity sites, or other concentrated use sites have been identified in the project area (construction corridor).

Potential roosting habitat primarily occurs where pine breaks are present, mostly on ridgelines beyond the 300- to 700-foot construction corridor. Potential foraging areas occur primarily over small reaches of intermittent or semi-perennial creek channels at the northern extent of the proposed disturbance corridor and isolated small ponds elsewhere within the project area, though bats also could forage among trees or over upland habitats near roosting habitat. Most creek channels and ponds in the area are often dry except during spring or immediately following a heavier precipitation event.

Migratory Bird Species of Management Concern in Wyoming

In May 2002, the USFWS Ecological Services office in Cheyenne, Wyoming released a revised list of 77 Migratory Bird Species of Management Concern in Wyoming; that list was current through 2012. Twenty-two of those 77 species are considered as Level I, which indicates a clear need for conservation action. Those same 22 species should also be evaluated for projects on NFS lands.

Nine of the 22 Level I species were discussed in Section 3.4.2 (*Sensitive Species*) of this document. The sage-grouse also is a MIS for the proposed project, and was discussed in detail in Section 3.4.3. Three other Level I avian species of concern also are Region 2 sensitive species: the sage sparrow (*Amphispiza belli*), northern goshawk (*Accipiter gentiles*), and black tern (*Chlidonias niger*). These three species were not selected for evaluation due to their limited potential for occurrence in the project area resulting from range considerations, the absence or paucity of appropriate habitat, or the lack of physical disturbance in appropriate habitat for those species.

Of the 10 remaining Level I species not already addressed, 6 are associated with open water or larger wetland habitats: the trumpeter swan (*Cygnus buccinators*), Franklin's gull (*Larus pipixcan*), Forster's tern (*Sterna forsteri*), whooping crane (*Grus Americana*), piping plover (*Charadrius melodus*), and Wilson's phalarope (*Phalaropus tricolor*). Wetland-type habitat is limited to 6.6 non-contiguous acres that dominated by grassland species and are often seasonally dry; open water is limited to approximately 0.23 acre where School Creek passes through the project area.

Upland sandpipers (*Bartramia longicauda*) prefer to forage and nest within homogenous grassland habitats. Although grasslands are present, large blocks are not prevalent within the majority of the project area and immediate vicinity. The Baird's sparrow (*Ammodramus bairdii*) is a short-grass prairie species. Although both of these species have been documented in southern Campbell County and on the TBNG, neither has been observed in the Mackey Road Relocation project area during targeted surveys or incidental to those conducted in overlapping areas for nearby coal mines.

The remaining two Level I species are raptors. Swainson's hawks have historically nested in the 1.0-mile analysis area. Three territories have been identified over time, though only one has been active in the last 7 years. The lone nest in that territory was last active in 2007; it is located at the western edge of the 1.0-mile analysis area, well beyond the USFS buffer distances for this species.

No short-eared owl (*Asio flammeus*) nests have ever been detected in the analysis area, though individual adults have occasionally been seen there during spring or fall. All sightings were presumed to be migrant birds passing through the area, as no defensive behavior indicating nesting activities was ever observed.

Waterfowl and Shorebirds

The project area and 1,000-foot (500 feet either side of center) analysis area for wetlands and other aquatic resources are comprised primarily of uplands, with limited occurrences of open water or wetlands. Water resources and associated potential wetland areas are very limited within the analysis area, occurring in the form of two creek crossings, and one playa and various isolated depressional areas in vegetated channels, respectively. Drainages in that area generally consist of vegetated, dry, ephemeral tributaries to School Creek that lack wetlands or ordinary high water marks. Small, isolated depressional areas occur within portions of some drainages, supporting short duration ponding and seasonal wetlands. A total of 6.64 non-contiguous acres of wetlands were delineated in the analysis area during 2011 and 2012, with approximately 3.99 non-contiguous acres on NFS lands. The project area crosses School Creek (semi-perennial) and Little Thunder Creek (intermittent) at the northern end of the corridor; only the School Creek crossing will be on NFS lands. A few small stock reservoirs also are present in the surrounding area that could provide limited, short-term habitat for resident or migrating waterfowl and shorebirds, but they are typically only wet during spring. Wetland delineation reports for the Mackey Road Relocation project are on file with the USACOE.

Waterfowl and shorebird observations have consisted of relatively low numbers of common species, often restricted to spring migration. No broods have been recorded in the area due to limited and unreliable water resources in the area. Species most often observed were the mallard (*Anas platyrhynchos*), killdeer (*Charadrius vociferus*), and red-winged blackbird (*Agelaius phoeniceus*).

Amphibians, Reptiles, and Fisheries

No reptile species of concern have been identified in the Mackey Road Relocation analysis area during long-term annual monitoring conducted in that area.

Northern leopard frogs have been documented within portions of Little Thunder Creek, with occasional sightings in the vicinity of the Mackey Road Relocation project (C. Painter, USFS biologist, personal communication). According to other Region 2 USFS Resource Specialists, a northern leopard frog was captured in School Creek in 2003, approximately 0.5 mile upstream of proposed creek crossing. Formal anuran surveys were not conducted within that area, but TWC biologists listened and watched for these frogs while conducting surveys for other wildlife species in spring and summer for at least the last 3 years, and considerably longer at the northern end of the project area where the best potential habitat occurs.

If this frog species is present within the project area, it likely occurs in very low densities in either Little Thunder Creek or the northern portions of School Creek, where flowing or standing water is most likely to occur. Other drainages in the project area generally consist of vegetated, dry, ephemeral tributaries to School Creek that lack wetlands or ordinary high water marks. Small, isolated depressional areas occur within portions of some drainages, supporting short duration ponding and seasonal wetlands. A total of 6.64 non-contiguous acres of wetlands were delineated in the analysis area during 2011 and 2012, with approximately 3.99 non-contiguous acres on NFS land. Only 0.34 acre of the 3.99 acres was classified as seasonally or periodically inundated palustrine aquatic bed (PAB) open water areas. These areas are located in a playa and isolated depressional areas in three unnamed, vegetated, dry ephemeral drainages. No Other Waters of the US channels were identified. If existing impoundments provide a consistent level of deep, well-oxygenated water throughout the year, overwintering habitat also may be present.

The WGFD has documented the plains minnow in Little Thunder Creek near Little Thunder Reservoir several miles upstream of the Mackey Road Relocation project area, as well as downstream from the Little Thunder/School Creek confluence. The flathead chub also has been captured in Little Thunder Creek outside the analysis area. That creek is intermittent, with some deeper persistent pools. School Creek is perennial in some reaches due, in part, to some perennial springs arising from the clinker aquifer along its east side that provide water year-round. Due to the ephemeral nature of, and disconnected pools within, drainages throughout the rest of the project area, these fish will not occur elsewhere in the project area.

Big Game

No crucial or critical big game ranges or migration corridors occur in or within several miles of the Mackey Road Relocation analysis area (construction corridor and 1.0-mile perimeter).

Pronghorn are the most common big game species within the analysis area, but are not abundant. This species is most often seen in sagebrush shrubland or mixed-grass prairie habitats in the general project area. The project area is within the Cheyenne River Pronghorn Herd Unit. The WGFD has classified the analysis area as winter/yearlong pronghorn range (i.e., a population or a portion of a population of animals make general use of this habitat on a year-round basis, with a significant influx of additional animals onto this habitat from other seasonal ranges in the winter). Results from regular surveys conducted in the overlapping NARM monitoring area from 1987 through 2012 have yielded an average of 4.5 pronghorn per square mile.

Mule deer are frequently observed in native and reclaimed habitats within existing surface coal mines west of the project area. In certain areas of the state, this species tends to be more migratory than white-tailed deer, traveling from higher elevations in the summer to winter ranges

that provide more food and cover. However, general monitoring has indicated that mule deer are not migratory in the vicinity of the analysis area. The project area is within the Cheyenne River Mule Deer Herd Unit. That area has been classified by the WGFD as being yearlong mule deer use range. Long-term winter ground surveys conducted at NARM have yielded an average of 96 animals per survey, or 0.6 mule deer per square mile.

The analysis area is within the Rochelle Hills Elk Herd Unit, in year-long range. Although elk are year-round residents in the area, most sightings occur in the pine breaks along the eastern portion of the analysis area. Elk also may calve in more protected regions of the analysis area; again, the exposed location of the project area (i.e., construction corridor) itself makes it unlikely that calving elk would use that specific area.

White-tailed deer are transients in southern Campbell County, but are most often seen in cottonwood corridors along primary creek drainages. Little habitat of that nature is present within the analysis area.

Because the entire project area is beyond the permit area of the NARM, public access and hunting are allowed in portions the project area.

Other Mammals

A variety of small and medium-sized mammal species occur in the vicinity of the Mackey Road Relocation analysis area, although most have not been observed in the project area itself. These species include predators and furbearers including, but not limited to, the coyote, red fox (*Vulpes vulpes*), striped skunk (*Mephitis mephitis*), long-tailed weasel (*Mustela frenata*), and badger (*Taxidea taxus*). Prey species include jackrabbits (*Lepus* spp.) and cottontails (*Sylvilagus* spp.), as well as various rodents, mice, voles, gophers, ground squirrels, chipmunks, and black-tailed prairie dogs. Most prey species are cyclically common and widespread throughout the region, and are important for raptors and other predators.

Sharp-tailed Grouse

In Wyoming, the plains sharp-tail grouse is locally common where grasslands are intermixed with other shrublands, especially in wooded draws, shrubby riparian areas, and wet meadows (Orabona et al. 2012). Sharp-tailed grouse are more commonly found in the northern portion of the TBNG in mixed-grass environments. The nearest known sharp-tailed grouse lek (Timber Creek) is approximately 39 miles to the north of the project area.

Environmental Consequences (Effects Analysis)

Alternative 1: No Action

Under the No Action alternative, the existing alignments of the Mackey County Road and the directly adjoining segment of the Temporary Reno Road will be retained, and no new road construction will occur. Mining will not occur under the approximately 6.1 miles of the existing Mackey County Road and 2.2 miles of existing Temporary Reno Road within the NARM permit area.

Most of the species evaluated either have not been documented in the analysis area, or occur seasonally or infrequently. Any species present are currently subject to injury or loss due to predation (avian and/or mammalian), collision with vehicles on existing roads, and/or current recreational shooting of prairie dogs in limited portions of the analysis area. As those impacts are already present, selection of the No Action alternative will not preclude existing risks to these species.

Alternative 2: Proposed Action

Raptors

Neither of the two active nest sites on NFS land is within a stated buffer distance for surface occupancy or timing of activities according to USFS standards. One of the nests has been used by multiple species over time, but red-tailed hawks have been the only species using the site in the last 7 years. Consequently, buffers associated with that species were applied to that nest site. Because both active nest sites are beyond the required buffer distances, no USFS standards will apply.

No active nest sites on private land are within a USFS standard buffer distance of activities proposed on NFS lands. No USFS standards or guidelines are applied to inactive nest sites regardless of surface ownership.

Construction activities are scheduled to occur during the non-breeding season and will last approximately 5 months; assuming the project remains on schedule, it will be completed prior to the following nesting season. Few, if any, trees (potential nesting or roosting habitat) will be physically impacted by the proposed project.

The above factors, and adherence to species-specific standards and guidelines (Appendix 1) as needed, will assure that the quality of known raptor nest sites will not be degraded by the Proposed Action. Annual monitoring of known raptor nests within the area may be recommended to document occupancy. The proposed project will not conflict with the Grassland Plan (USFS 2002), or any future objectives to manage the area for raptor species.

Bats

No known bat roost sites, maternity sites, or other concentrated use sites will be physically impacted by the Mackey Road Relocation project. The project will have limited, if any, impacts on potential habitats for such activities as few, if any, trees will be removed during construction. Though trees may not be physically removed, the proximity of the new road could impact potential roosting or foraging habitats in some locations. Disturbances in open water foraging habitats will consist of replacing or constructing creek crossings and widening or building the road at those locations. Construction will occur during daylight hours and in the fall/winter months, when bat species are inactive or absent from the area. These factors will minimize potential impacts on bats and their habitats during construction. However, they will not alleviate potential long-term impacts of increased traffic associated with the final right-of-way.

The construction plan for the proposed project and adherence to any relevant species-specific Standards and Guidelines will minimize impacts on potential bat roosting habitats. Given the distance between the construction area and the nearest potential roosting habitat, the timing and nature of the project, and the minimal long-term habitat disturbance that will result, direct and indirect impacts to bats will be minimal, if they occur at all. Additional impacts from the project and associated activities are not expected to increase the cumulative impacts to a point that could negatively impact bat populations. Including shrubs and trees in reclamation of disturbed riparian areas will help replace potential foraging and long-term roosting habitat. The proposed project will not conflict with the TBNG LRMP (USFS 2002), or any future objectives to manage the area for bat species.

Migratory Bird Species of Management Concern

The Proposed Action, in combination with other operations near the analysis area, could potentially impact individual species of concern discussed in this section. However, due to the absence of most species in the project area during the anticipated construction period (non-breeding season) and the proximity of current disturbance activities, the Proposed Action is not expected to increase the potential cumulative impacts to a point that will negatively impact populations of any species discussed in this document. Additionally, the proposed project will not conflict with the Grassland Plan (USFS 2002), or any future objectives to manage the area and provide habitat for migratory birds.

Aquatic-related Species (Waterfowl, Shorebirds, Amphibians, and Fish)

Disturbance impacts to aquatic species and habitats on NFS lands will be limited to the new School Creek crossing; the Little Thunder Creek crossing to be reconstructed is on private lands. Aquatic species occur in low densities in the analysis area, if at all. If present, these species could be impacted by the replacement or installation of culverts at creek crossings and/or runoff and sedimentation from construction and maintenance activities near the creeks. Improper installation of culverts could negatively affect frog habitat and/or fish passage at creek crossings. Disruption of groundwater flow into School Creek from the nearby clinker aquifer also could occur. Wetlands and other riparian areas also could be negatively affected by sedimentation resulting from construction and maintenance activities. Creeks could be exposed to aquatic invasive species known to be extremely detrimental to water systems and difficult to eradicate once they are established.

Potential impacts to aquatic resources will be minimized by numerous factors. Prior to construction, the contractor will be required to obtain a WDEQ Stormwater Pollution Prevention Plan permit that will remain in force until the construction area has been adequately re-vegetated and the slopes and ditches fully stabilized. The timing (during low flow) of road construction and the installation of culverts designed to maintain post-construction habitat connectivity and prevent down-cutting and head-cutting within the stream channels will help minimize project-related disturbance and restore habitat conditions once construction is completed. Vehicular traffic will use existing roads and two-tracks to access the project area, especially where stream crossings are necessary. Servicing and refueling equipment and vehicles away from streams and riparian areas, and staging equipment at least 300 feet from those areas, will further reduce the potential for contamination of aquatic resources. The use of best management practices for

control of erosion and sedimentation, and prevention of aquatic invasive species and weedy species into the project area, will further minimize potential impacts in the area. Upon completion of the project, all road cuts, fill slopes, topsoil stockpiles, and other areas disturbed outside the permanent right-of-way as a result of this project will be reclaimed using appropriate techniques and seed mixes. Impacts to the 0.15 acre of USACOE jurisdictional wetlands will be mitigated immediately adjacent to the disturbance area, per agency direction; that disturbance will occur on private surface. Given the limited and non-contiguous nature of potential impacts, the mobility of potentially affected wildlife species, and the availability of other suitable habitat outside the narrow construction corridor, the proposed project is not expected to have any long-term effects on aquatic species using the area. Additionally, the proposed project will not conflict with the Grassland Plan (USFS 2002), or any future objectives to manage the area and provide habitat for aquatic species of concern.

Big Game

As noted, the project will disturb approximately 292.7 short-term acres (i.e., during construction) and 85.7 long-term acres (new infrastructure and post-construction maintenance) on NFS lands. The latter total will be within the final 100-foot right-of-way for the relocated road. Construction activities and post-construction use of the relocated road will result in altered and/or fragmented habitats either not currently subject to such disturbance or not currently exposed to traffic levels expected to occur upon completion of the project. The introduction of invasive and/or weedy plant species is also possible as equipment and other vehicles enter the project area during construction, operation, or maintenance of the new road. Increased levels of dust and noise also are likely to result from the project, both during and after construction. In addition to increased vehicular traffic, greater public access to NFS lands post-construction will likely lead to an increase in year-round recreational activities such as hiking and hunting that could be disruptive to any animals foraging or raising young in the area and cause animals to avoid the construction area and/or shift their normal habitat use.

The timing of the project during the non-breeding season will minimize potential impacts on big game and their habitats during construction, but will not alleviate impacts, especially long-term impacts associated with the final right-of-way. Descriptions of required mitigation measures to offset impacts to sage-grouse and best management practices to protect aquatic resources also will benefit other wildlife species. Other mitigation measures also might be appropriate, both for big game and to mitigate losses of secluded public lands for hunters and other recreationists. The use of wildlife-friendly fencing will facilitate passage of big game animals through the project area once construction is complete. Game crossing signs and reduced speed limits through the most likely elk habitat (i.e., areas nearest timber) will help reduce the potential for injuries or mortalities due to vehicle collisions. The use of unpalatable, cool season grasses during reclamation along the right-of-way itself could minimize the enticement of big game and other wildlife into the travel corridor, further reducing potential collisions with vehicles during construction and operation of the relocated road. Training for construction personnel will reduce the likelihood of unintentional trespass and impacts to wildlife from shooting, companion dogs, and other potential disturbances.

Other Mammals, Reptiles, and Sharp-tailed Grouse

Medium-sized mammals (such as lagomorphs, coyotes, and foxes) could be temporarily affected during construction. Direct losses of small mammals and reptiles may be higher than for other wildlife because their mobility is more limited and many will retreat into burrows when disturbed. However, the timing of the project and the high reproductive potential of these species will minimize such impacts. Due to the absence of sharp-tailed grouse from the area, the Proposed Action will have no impact on this species.

Cumulative Effects for the Proposed Action

General short- and long-term cumulative effects under the Proposed Action are the same as those described for other species, above, with disturbances arising from multiple sources currently present or potentially occurring on lands within the Mackey Road Relocation analysis area. Examples of such disturbances include, but are not limited to, energy projects, transportation infrastructure, utility and communication lines, grazing, and various forms of recreation. Minerals extraction is expected to increase in portions of the analysis area within the reasonably foreseeable future. Disturbances such as pipelines, power lines, roads, and facilities tend to fragment or reduce the effectiveness of remaining habitats within the vicinity of development. In addition, these activities often result in increased noise and dust levels, new long-term or permanent facilities, potential introduction of invasive and/or weedy plant species, and a generally increased human presence, among others. Factors such as drought, the appearance of new diseases, and changes in the local fire regime also can compound cumulative impacts. An incremental loss of wildlife habitat will occur in the general vicinity as a result of several of these factors, with some wildlife species affected until reclaimed habitats are established in disturbed areas outside permanent rights-of-way or plant succession restores areas affected by natural causes such as fire or drought. A total of 85.7 additional acres of long-term disturbance on NFS lands will occur under the Proposed Action.

The overall result of implementing either alternative for the proposed project will be that some individuals may be lost or exhibit avoidance behaviors and shifts in habitat use (e.g., elk). For most species, cumulative impacts are not expected to significantly reduce the size or viability of either their local populations or the Grassland-wide populations. Neither the Proposed Action nor the No Action alternative will conflict with the current LRMP, or any future objectives to manage the TBNG for the other species evaluated.

Mixed sagebrush-grasslands, upland grasslands (including prairie dog colonies), and limited aquatic and wetland resources occur within the proposed project area; the majority of project-related disturbances will occur in upland grassland habitats. Approximately 8.6 acres of one active colony on private surface will be intersected by the proposed construction corridor; that represents approximately 2% of the total active colony acreage in the 1.0-mile analysis area. No prairie dog colonies on NFS lands will be impacted by the project. Approximately 1.4 acres of USACOE jurisdictional wetlands fall within the project area (road corridor). Only 0.15 acre of such wetlands will be disturbed by project activities; that disturbance will occur on private surface. Per the USACOE, those impacts will be mitigated at a 1:1 ratio immediately adjacent to the project area under a Nationwide Permit 14. Few, if any, trees will be disturbed in the project

area, though cottonwoods and pine breaks are present along the two primary creeks and on some ridges along the proposed right-of-way.

Due to the lack of occurrence of most of these remaining species in the area, the timing and location of the project, and its relatively limited nature and duration, the Mackey Road Relocation project is not expected to increase the potential cumulative impacts to a point that will negatively impact populations of any species discussed in this document. The species most likely to experience impacts from the Proposed Action have large populations within TBNG or are sufficiently generalist and mobile in their habitat use to avoid detrimental impacts. Additionally, required mitigation measures and voluntary conservation measures implemented for targeted species of concern in the area also will benefit other wildlife species throughout the analysis area. Furthermore, the Proposed Action will not conflict with the current LRMP, or any future objectives to manage wildlife resources on the TBNG.

Determination of Effects and Rationale for Other Wildlife Species

Both the Proposed Action and No Action alternative **may impact individuals but not likely to cause a trend to federal listing or loss of viability in the planning area** for other wildlife species in the project and analysis area.

Short-Term Use/Long-Term Productivity, Unavoidable Adverse Impacts, Irreversible or Irretrievable Impacts on Wildlife Resources

No loss in long-term productivity of wildlife species is expected under either alternative.

No unavoidable adverse effects on wildlife species are expected under either alternative.

Given that mitigation requirements will be implemented for sage-grouse that can also benefit other sagebrush-obligate or dependent species, no irreversible or irretrievable impacts on wildlife resources will occur under either alternative. Those requirements will be supplemented with voluntary conservation measures implemented in suitable habitat elsewhere in the TBNG.

3.5 Vegetation Resources

The vegetation analysis area encompassed a 600- to 700-foot wide corridor centered over the 8.72 mile proposed road relocation. Consequently, habitat descriptions in that narrow band may not reflect the conditions present throughout the greater survey perimeter for other resources. More detailed information regarding plant species of concern is available in the vegetation BA/BE and Plant Species of Local Concern reports for this project, on file with the Douglas Ranger District office.

Vegetation analyses presented in this FEIS tier to at least 14 separate NEPA analyses for projects on NFS land that have already been approved by the USFS. Ten of the 14 analyses were for BA/BEs, 3 were for environmental assessments, and 1 was for another EIS.

- Mackey Road Relocation Biological Assessment/Biological Evaluation and Plant Species of Local Concern Report (2012)
- School Creek Mine Ancillary Facilities Special Use Permit Environmental Assessment (2012)

- North Antelope Rochelle Mine North Pit 69 kV Power Line Relocation and School Creek Mine 69 kV Power Line Spur Environmental Assessment (2010);
- Wright Area Coal LBA Final Environmental Impact Statement (2010);
- Thunder Basin Travel Management Plan BA/BE (2009);
- Antelope Road Relocation Environmental Assessment (2009);
- Highway 450 to School Creek Mine Power Line BA/BE (2008);
- NARM's LBA3 Umbrella BA/BE (2006);
- Kennecott Energy's Antelope Coal Mine 69 kV Transmission Line Project BA/BE (2005);
- Boss Draw Power Line BA/BE (2005);
- AVF Exchange Drilling BA/BE (2005);
- Teckla Bulk Transmission Substation Enlargement BA/BE (2002);
- Porcupine (a.k.a. Teckla) Distribution Substation and Tie Line BA/BE (2002); and
- East Teckla Power Distribution Lines for the Peabody Gas Wells BA/BE (2002).

Vegetation communities within the analysis area are general classified as Big Sagebrush Shrubland, Upland Grassland, Scoria Grassland, or Ponderosa Pine Woodland. The Big Sagebrush Shrubland vegetation community is characterized by 20-30% big sagebrush cover. Dominant grass species in the understory include needle-and-thread, western wheatgrass, prairie junegrass, and cheatgrass. The Upland Grassland vegetation community has similar vegetation species composition, but with less than 20% big sagebrush cover. The Scoria Grassland vegetation community is located along the scoria hills and is dominated by needle-and-thread, threadleaf sedge, blue grama, prairie junegrass, cheatgrass, and broom snakeweed (*Gutierrezia sarothrae*). The Ponderosa Pine Woodland vegetation community also is located along the scoria hills. Dominant overstory vegetation species within this community include ponderosa pine and Rocky Mountain juniper. Dominant understory vegetation species include western wheatgrass, prairie junegrass, needle-and-thread, threadleaf sedge, and blue grama.

Visual vegetation cover estimates range from 30-60% in the Scoria Grassland vegetation community and 50-75% in the Upland Grassland vegetation community. Overall, the visual cover estimate for the Big Sagebrush Shrubland vegetation community is 60-95%. Big sagebrush cover within that community is 20-30%, grass cover is 60-80%, and forb cover is 5-10%. The visual cover estimate for the Ponderosa Pine Woodland vegetation community is 60-95%. Ponderosa pine cover within that community is 20-30%, Rocky Mountain juniper cover is 5-10%, grass cover is 50-70%, and forb cover is 5-10%.

The soils within the vegetation analysis area consist mainly of fine, loamy, and fine loamy textures with the occasional coarse loamy texture.

Existing Conditions

3.5.1 Threatened, Endangered, and Proposed Plant Species Considered and Evaluated

Kelly (2009) lists two plant species for site-specific consideration in project planning on the TBNG:

1. the endangered blowout penstemon (*Penstemon haydenii*)
2. the threatened Ute ladies'-tresses (*Spiranthes diluvialis*).

Pedestrian and vehicular reconnaissance habitat and species surveys were conducted for Ute-ladies'-tresses during the approved survey window in August 2006 and 2011. Surveys for habitat only also were conducted in July and November 2010. Vehicular and pedestrian field reconnaissance habitat and species surveys for blowout penstemon were conducted on June 17, 18, 25, and 28, 2010. Additional details regarding federally listed plant species can be found in the vegetation BA/BE/Plant Species of Local Concern report for this project, on file with the Douglas Ranger District.

Blowout penstemon is identified as occurring on sand dunes and associated blowouts below 8,000 feet in elevation. Heidel (2008) indicates that it is currently known to occur on the rim and lee slopes of blowouts and associated steep slopes deposited at the base of foothills. In Wyoming, the habitat is typically found on sandy aprons or the lower half of steep sandy slopes deposited at the base of granitic or sedimentary mountains or ridges (Fertig 2001a). In Nebraska, it occurs in sparsely vegetated, early successional, shifting sand dunes and blowout depressions created by wind (Fritz et al. 1992).

Based on Natural Resource Conservation Service (NRCS) soils data (U.S. Department of Agriculture [USDA] NRCS 2008a, 2008b) and 2010 survey results, no blowout penstemon individuals, populations, or suitable habitat is present within the analysis area. Soils derived from eolian sources with high wind erosion potential within the analysis area were stabilized by a moderate to high percentage of vegetation cover preventing the development of the blowout and dune formations required for the establishment of blowout penstemon individuals or populations. Therefore, the blowout penstemon was not carried further in the analysis.

Ute ladies'-tresses occur along riparian edges, gravel bars, old oxbows, high flow channels, and moist to wet meadows along perennial streams. It typically occurs in stable wetland and seep areas associated with old landscape features within historical floodplains of major rivers. It also is found in wetland and seep areas near freshwater lakes or springs (USFWS 1995). Soils range from alluvial sand and coarse silt to whitish loamy clays with a pH between 7.7 and 7.8, derived from alluvial deposits on sandstones and claystones (Fertig and Heidel 2007). In any given year, mature plants are in flowering, non-flowering (vegetative) and seasonally dormant stages persisting belowground (USFWS 1995).

Ute ladies'-tresses have been found adjacent to the TBNG on BLM, and State land, but it is yet to be discovered on NFS lands in the TBNG (Chumley et al. 1998, Fertig and Heidel 2007, Heidel 2001, 2007). Heidel (2007) states that the Ute ladies'-tresses is known in eastern Wyoming "from three geographic centers of distribution...a portion of the Antelope Creek watershed, a portion of the Niobrara River watershed, and a portion of the Horse Creek watershed." The analysis area is not located within any of these three watersheds. The nearest known occupied habitat is approximately 30 miles west of the analysis area.

Local habitat was confirmed unsuitable for Ute ladies'-tresses within the analysis area, based on 2006, 2010, and 2011 survey results. The analysis area crosses Little Thunder Creek and School Creek at its northern extent. Neither creek provided an adequate late season perennial water source for Ute ladies'-tresses. The lack of such a water source, abrupt bank transitions, clay loamy soils, and dense vegetation cover along both creeks provide unsuitable habitat. Therefore, Ute ladies'-tresses was not carried further in the analysis.

Summary information regarding the potential for occurrence of each federally listed plant species in the analysis area, actual occurrence in the local area, and presence of appropriate habitat in the analysis area is presented in Table 3-6.

Table 3-6. Occurrence and availability of suitable habitat for federally endangered, threatened, proposed, or candidate plant species within the Mackey Road Relocation analysis area.

Common Name <i>Scientific Name</i>	Potential for Occurrence in Analysis Area	Occurrence in Local Area	Presence of Habitat in Analysis Area
Blowout penstemon ^E <i>Penstemon haydenii</i>	Very Unlikely ¹	Undocumented	No suitable habitat within the analysis area due to the lack of soils derived from eolian sources, deep sandy soils, and blowout or dune habitats.
Ute ladies'-tresses <i>Spiranthes diluvialis</i> ^T	Very Unlikely ¹	Undocumented	No suitable habitat within the analysis area due to the lack of a late season perennial water source, abrupt transition zones, and clay loamy soils in the transition zone.

¹ Based on habitat requirements and known range.

^E Classified as "Endangered" under the U.S. Endangered Species Act of 1973.

^T Classified as "Threatened" under the U.S. Endangered Species Act of 1973.

Environmental Consequences (Effects Analysis)

A summary of determinations of effect based on recent survey efforts and documented vegetative and soil characteristics in the area is provided in Table 3-7.

Alternative 1: No Action

Under the No Action alternative, the existing alignments of the Mackey County Road and the directly adjoining segment of the Temporary Reno Road will be retained, and no new road construction will occur. Mining will not occur under the approximately 6.1 miles of the existing Mackey County Road and 2.2 miles of existing Temporary Reno Road within the NARM permit area.

No new effects on federally listed plant species or their habitats associated with the Mackey Road Relocation Project will occur under the No Action alternative.

Table 3-7. Determinations of effect and their primary justification for federally endangered, threatened, proposed, or candidate plant species within the Mackey Road Relocation analysis area.

Evaluated Species	Effects Determination		Justification
	Alternative 1	Alternative 2	
Blowout penstemon	<i>No Effect</i>	<i>No Effect</i>	No suitable habitat in analysis area; individuals absent during June 2010 surveys.
Ute ladies'-tresses	<i>No Effect</i>	<i>No Effect</i>	No suitable habitat in analysis area; individuals absent during August 2006 and August 2011 surveys.

Alternative 2: Proposed Action

Based on the above information regarding the lack of individuals and their potential habitats within the analysis area, no new effects on federally listed plant species will occur under the Proposed Action.

Cumulative Effects for the Proposed Action

Cumulative effects are described as the effects of the action when added to past, on-going, or reasonably foreseeable actions (36 CFR § 220.4 (f) of 07/24/08). No cumulative effects will result from the project, because no direct or indirect effects will occur as a result of the Proposed Action.

Determination of Effects and Rationale

The No Action alternative will have **no effect** on blowout penstemon and Ute ladies'-tresses due to the absence of individuals and their potential habitats.

Implementation of the Proposed Action also will have **no effect** on blowout penstemon and Ute ladies'-tresses due to the absence of individuals and their potential habitats.

3.5.2 USFS Region 2 - Sensitive Plant Species

The 2012 Region 2 sensitive species list includes 43 plant species, 11 of which are known to occur or are suspected (biologically or geographically) to occur on the TBNG (Roche 2009b). Due to the extended timeline for project surveys, the 2009 sensitive plant species list was used in 2010 and 2011, and the 2012 list was used that year. Potential effects are evaluated if individuals are present, or if suitable but unoccupied habitat is present and inventory methods are not feasible or effective for providing information on presence/absence or number and location of individuals. No further analysis is required for plant species that are not known or suspected to occur in the analysis area, and for which no suitable habitat is present (Thompson 2001). Additional details regarding Region 2 sensitive plant species can be found in the vegetation BA/BE/Plant Species of Local Concern report for this project, on file with the Douglas Ranger District.

Existing Conditions

Of the 11 Region 2 sensitive plant species that could be present, none occurred within or near the analysis area during pedestrian and vehicular reconnaissance surveys conducted in 2006, 2010, and 2011 (BKS 2006, 2010, 2011). However, potential Barr's milkvetch (*Astragalus barrii*) individuals/populations were found during the 2012 surveys. Suitable habitats for both Barr's milkvetch and common twinpod (*Physaria didymocarpa* var. *lanata*) also were identified within the analysis area. Summary information regarding the occurrence of each Region 2 sensitive plant species on the TBNG, presence of appropriate habitat in the analysis area, and rationale for analysis is presented in Table 3-8.

Barr's milkvetch typically occurs in sparsely vegetated grasslands or sagebrush-grasslands with 50% or less total ground cover. In Wyoming, this species usually occupies thinly vegetated patches between stands of other plant species (Ladyman 2006). Barr's milkvetch is not tolerant of high salinity, but is strongly associated with calcareous soils and is restricted to a particular combination of soil characteristics (Ladyman 2006). This plant grows on slopes of various inclines, ranging from nearly level to 70% (Ladyman 2006). In Wyoming, Barr's milkvetch is restricted to upper- and mid-slope topographic positions, often on north- and east-facing aspects and occurs at elevations between 3,600 and 6,000 feet (Handley 2008). The suitable habitat within the construction corridor and analysis areas consisted of scoria breaks and badlands with sparse vegetation cover. A potential population of approximately 10-15 Barr's milkvetch individuals was observed in T42N, R69W, SESE Section 6 within the proposed construction corridor. However, positive identification beyond *Genus* could not be made due to lack of flowering individuals. Specific locations of suitable Barr's milkvetch habitat within the analysis area are provided in the vegetation BA/BE/Plant Species of Local Concern report for this project, on file with the Douglas Ranger District.

Common twinpod "occurs on redbed clay-shale slopes, limey-sandstone outcrops, roadcuts, and other exposed rock-cliff substrates at 3,600 to 9,680 feet" (Fertig 2006). In Wyoming, this species typically ranges from 4,600 to 7,000 feet (Heidel and Handley 2004). Suitable habitat identified within the construction corridor and analysis area consisted of scoria hills (10 to 25%) with moderate vegetation cover and scoria outcrops. Specific locations of suitable common twinpod habitat within the analysis area are provided in the vegetation BA/BE/Plant Species of Local Concern report for this project, on file with the Douglas Ranger District.

Environmental Consequences (Effects Analysis)

A summary of determinations of effect based on recent survey results and documented vegetative and soil characteristics in the area is provided in Table 3-9.

Alternative 1: No Action

Under the No Action alternative, the existing alignments of the Mackey County Road and the directly adjoining segment of the Temporary Reno Road will be retained, and no new road construction will occur. Mining will not occur under the approximately 6.1 miles of the existing Mackey County Road and 2.2 miles of existing Temporary Reno Road within the NARM permit area.

Table 3-8. Analysis rationale and summary for Region 2 Sensitive plant species potentially occurring in the Mackey Road Relocation analysis area.

Common Name <i>Scientific Name</i>	Occurrence on TBNG	Suitable Habitat in Analysis Area	Rationale If Not Carried Forward for Analysis
Barr's milkvetch <i>Astragalus barrii</i>	Documented	Yes	Evaluated - local habitat confirmed suitable.
Iowa moonwort <i>Botrychium campestre</i>	Suspected	No	Local habitat confirmed unsuitable due to the lack of dunes or fields.
Narrowleaf moonwort <i>Botrychium lineare</i>	Possibly	No	Local habitat confirmed unsuitable; sandy soils present are not of calcareous sandstone or limestone parent material.
Foxtail sedge <i>Carex alopecoidea</i>	Suspected	No	Local habitat confirmed unsuitable due to the lack of lack streams and associated species.
Prairie dodder <i>Cuscuta plattensis</i>	Suspected	No	Local habitat confirmed unsuitable due to the lack of habitat and associated species.
Elliptic spikerush <i>Eleocharis elliptica</i>	Suspected	No	Local habitat confirmed unsuitable due to the lack of seepage areas and adequate moisture regime.
Visher's buckwheat <i>Eriogonum visherii</i>	Vicinity	No	Local habitat confirmed unsuitable; eroded banks and soils with badland inclusions do not fit the ecological description of a badland.
Plains rough fescue <i>Festuca hallii</i>	Possibly	No	Local habitat confirmed unsuitable due to lack of volcanic black soils, limestone plains, tundra zones, or montane meadows.
Common twinpod <i>Physaria didymocarpa</i> var. <i>lanata</i>	Suspected	Yes	Evaluated - local habitat confirmed suitable.
Largeflower triteleia <i>Triteleia grandiflora</i>	Possibly	No	Local habitat confirmed unsuitable due to lack of associated species and community composition.
American cranberrybush <i>Viburnum opulus</i> var. <i>americanum</i>	Suspected	No	Local habitat confirmed unsuitable due to the lack of adequate moisture regime and associated woodlands.

No new impacts to Region 2 sensitive plant species associated with the Mackey Road Relocation project will occur under the No Action alternative.

Alternative 2: Proposed Action

The Proposed Action will directly impact a maximum of 31.56 non-contiguous acres of suitable Barr's milkvetch habitat and 65.78 non-contiguous acres of suitable common twinpod habitat within the construction corridor. Approximately 10-15 potential Barr's milkvetch individuals will be lost as a result of construction activities. Losses to these habitats within the construction

Table 3-9. Determinations of effect and their primary justification for Region 2 Sensitive plant species within the Mackey Road Relocation analysis area.

Evaluated Species	Effects Determination		Justification
	Alternative 1*	Alternative 2	
Barr's milkvetch	No impact	May impact individuals but not likely to result in a loss of viability in the planning area nor cause a trend to federal listing.	A maximum of 31.56 acres of suitable habitat and a population of 10-15 individuals will be lost within the construction corridor; 21.64 acres of suitable habitat within the analysis area will not be impacted.
Common twinpod	No impact	May impact individuals but not likely to result in a loss of viability in the planning area nor cause a trend to federal listing.	A maximum of 65.78 acres of suitable habitat will be lost within the construction corridor; 41.31 acres of suitable habitat within the analysis area will not be impacted.

* Effects under the No Action alternative would be due to the continued presence of previously permitted mining operations and other non-coal related activities.

corridor should be considered permanent because current reclamation techniques do not adequately restore them. Suitable habitats for other Region 2 sensitive plant species identified within the analysis area, but outside the construction corridor, will not be impacted under the Proposed Action.

Potential indirect effects to suitable habitats within the construction corridor include increased erosion and/or sediment deposition during construction activities, resulting in habitat loss or degradation. Dust deposition from vehicular traffic also has been shown to lower photosynthetic rates, respiration, transpiration, and overall productivity in plants (Farmer 1993, Vardaka et al. 1995). After construction is complete, PPRM will reclaim the affected area in accordance with USFS regulations and requirements through the use of appropriate methods and seed mixes. The use of best management practices for erosion and sedimentation control, as needed, will minimize the potential for such impacts.

Soil disturbance resulting from the Proposed Action may create conditions suitable for noxious and invasive plant species to reproduce. The competitive ability of Barr's milkvetch and common twinpod is presumed to be lower than these undesired species. Consequently, noxious and invasive species may outcompete the native plants, preventing them from becoming reestablished in weed dominated areas (Ladyman 2006, Handley and Heidel 2011). If a noxious weed invasion occurred within suitable habitat, any existing populations of Barr's milkvetch and common twinpod would likely be lost, resulting in changes in plant species composition and community type, and ultimately a loss of suitable habitat. A secondary threat from weed invasion is alteration of the existing fire regime. Some introduced species, especially cheatgrass

(a common invader in the project area), can increase the annual accumulation of litter which can then increase the wildfire frequency beyond the tolerances of many native plants, including Barr's milkvetch and common twinpod (Ladyman 2006, Handley and Heidel 2011). As noted, the use of best management practices during construction and reclamation efforts will help control the possibility for noxious and invasive species to become established. Upon project completion, Campbell County will be responsible for long-term control of noxious and invasive species within the final right-of-way.

Cumulative Effects for the Proposed Action

Cumulative effects are described as the effects of the Proposed Action when added to past, on-going, or reasonably foreseeable actions (36 CFR § 220.4 (f) of 07/24/08).

The amount of suitable Barr's milkvetch habitat present within the TBNG or range-wide has not been quantified, nor has the total amount of such habitat lost or degraded due to human-caused disturbance and activities, including climate change. The Mackey Road Relocation project will add minimal additional impacts, as a potential population of only 10-15 individuals was discovered in the construction corridor and a maximum of 31.56 non-contiguous acres of suitable habitat will be permanently lost or degraded. That level of impact comprises less than 1% of known suitable habitats and populations across the PRB. Direct impacts to suitable habitat in the TBNG, PRB, and range-wide are currently associated with resource extraction, road construction/modification, recreational activities, urbanization, grazing, and noxious and non-native weed invasions. Such impacts can include destruction of suitable habitat, increased soil erosion and deposition from extensive removal of vegetation, soil compaction and resulting erosion from livestock trampling, increased deposition of dust from traffic, and noxious weed and non-native species invasions resulting from soil disturbance, transportation of weeds seeds by human, animal, vehicle, and rail traffic. Indirect effects associated these activities result in the degradation and loss of suitable habitat range-wide. Global climate change resulting in increased erosion also could cause a loss of suitable habitat range-wide.

Suitable and occupied common twinpod habitat range-wide is estimated to be approximately 725 non-contiguous acres; the estimated population range is 19,935 to more than 29,995 plants. However, these numbers are likely low due to the lack of information for some populations (Handley and Heidel 2011). Neither the amount of suitable habitat within the TBNG nor the total amount of suitable habitat lost or degraded due to human-caused disturbance and activities, including climate change, have been quantified. The Mackey Road Relocation project is not expected to add additional impacts to individuals or populations for this species because none were discovered during targeted surveys. A maximum of 65.78 acres of suitable common twinpod habitat will be permanently lost or degraded within the construction corridor. That acreage is estimated to comprise less than 10% of known suitable habitat across the species' range. Direct and indirect impacts to suitable common twinpod habitat in the TBNG, PRB, and range-wide are the same as those described for the Barr's milkvetch, above.

Determination of Effects and Rationale

The No Action alternative is **not likely to cause a trend towards federal listing** of Region 2 sensitive plant species due to the absence of individuals and/or the limited project-related disturbance in potential habitat.

The Proposed Action also is **not likely to cause a trend toward federal listing** of Region 2 sensitive plant species. The Proposed Action will affect a maximum of 31.56 and 65.78 non-contiguous acres of suitable habitat for the Barr's milkvetch and common twinpod, respectively. Additionally, the Proposed Action will impact a potential population of only 10-15 individuals of Barr's milkvetch; no common twinpod plants are present in the project or analysis areas. Despite these additional impacts, the Proposed Action, in combination with past, present, and reasonably foreseeable future actions, is not likely to result in a loss of viability within the TBNG planning area or cause a trend toward federal listing or a loss of species viability for any Region 2 sensitive plant species.

3.5.3 Plant Species of Local Concern

Plant Species of Local Concern are species that are documented or suspected to be at risk at a forest-wide scale, but do not meet the criteria for regional sensitive plant species designation because they are reasonably secure in parts of their range. These could include plant species with declining trends in only a portion of that region. Risk to plant species viability may differ at national, regional, and local scales. Plant species at the edge of their range may not merit regional sensitive plant species status, but may be important elements of biological diversity for the Forest/Grassland unit (USFS 2003a). Not all plant species listed are considered to be of local concern for a particular analysis area. No further analysis is required for plant species that are not known or suspected to occur in the analysis area, and for which no suitable habitat is present (Thompson 2001). Potential effects are evaluated if suitable but unoccupied habitat is present and inventory methods are not feasible or effective for providing information on presence/absence or number and location of individuals. Additional details regarding plant Species of Local Concern can be found in the vegetation BA/BE/Plant Species of Local Concern report for this analysis area, on file with the Douglas Ranger District office.

Existing Conditions

Of the 20 plant Species of Local Concern on the TBNG, none occurred within or near the analysis area during the pedestrian and vehicular reconnaissance surveys conducted on June 7 and 8, 2006; June 17, 18, 25, and 28, 2010; July 12, 2011; and June 7, 2012. However, habitat for lemon scent (*Pectis angustifolia*) was identified within the analysis area. Summary information regarding the occurrence of each plant Species of Local Concern on the TBNG, presence of appropriate habitat in the vegetation analysis area, and rationale for project analysis is presented in Table 3-10.

Lemon scent is found in mountain shrublands and grasslands on sandbars in sandy ravines, gravel hills, or scoria outcrops of red clinker. The elevation range for this plant is between 4,000 and 4,800 feet (Fertig 2001b). The suitable habitat identified within the Mackey Road Relocation analysis area consisted of scoria hills with moderate vegetation cover and scoria

Table 3-10. Analysis rationale and summary for plant Species of Local Concern potentially occurring in the Mackey Road Relocation analysis area.

Common Name <i>Scientific Name</i>	Occurrence on TBNG	Rationale If Not Carried Forward for Analysis
Muskroot <i>Adoxa moschatellina</i>	Suspected	Local habitat confirmed unsuitable
Narrowleaf water plantain <i>Alisma gramineum</i>	Remotely Possible	Local habitat confirmed unsuitable
Summer milkvetch <i>Astragalus hyalinus</i>	Documented	Local habitat confirmed unsuitable
Ragleaf bahia <i>Bahia dissecta</i>	Remotely Possible	Local habitat confirmed unsuitable
Leathery grapefern <i>Botrychium multifidum</i> var. <i>coulteri</i>	Remotely Possible	Local habitat confirmed unsuitable
Large water-starwort <i>Callitriche heterophylla</i>	Suspected	Local habitat confirmed unsuitable
Sartwell's sedge <i>Carex sartwellii</i> var. <i>sartwellii</i>	Suspected	Local habitat confirmed unsuitable
Smooth goosefoot <i>Chenopodium subglabrum</i>	Documented	Local habitat confirmed unsuitable
Watson's goosefoot <i>Chenopodium watsonii</i>	Documented	Local habitat confirmed unsuitable
Slimleaf panicgrass <i>Dichanthelium linearifolium</i>	Suspected	Local habitat confirmed unsuitable
Flat-top goldentop <i>Euthamia graminifolia</i>	Suspected	Local habitat confirmed unsuitable
Bitter root <i>Lewisia rediviva</i>	Vicinity	Local habitat confirmed unsuitable
Rocky Mountain blazing star <i>Liatris ligulistylis</i>	Vicinity	Local habitat confirmed unsuitable
Rosy palafox <i>Palafoxia rosea</i> var. <i>macrolepis</i>	Documented	Local habitat confirmed unsuitable
Lemon scent <i>Pectis angustifolia</i>	Documented	Evaluated - local habitat confirmed suitable
Rocky Mountain polypody <i>Polypodium saximontanum</i>	Remotely Possible	Local habitat confirmed unsuitable
Fineleaf pondweed <i>Stuckenia filiformis</i>	Documented	Local habitat confirmed unsuitable
Sago pondweed <i>Stuckenia pectinata</i>	Documented	Local habitat confirmed unsuitable
Western poison ivy <i>Toxicodendron rybergii</i>	Documented (NC?)	Local habitat confirmed unsuitable
New Wyoming Xanthoparmelia lichen <i>Xanthoparmelia neowyomigicia</i>	Suspected	Local habitat confirmed unsuitable

outcrops. These areas overlapped those identified for the common twinpod. Specific locations of suitable habitat within the analysis area are provided in the vegetation BA/BE/Plant Species of Local Concern report for this project, on file with the Douglas Ranger District.

Environmental Consequences (Effects Analysis)

A summary of determinations of effect based on recent survey results and documented vegetative and soil characteristics in the area is provided in Table 3-11.

Table 3-11. Determinations of effect and their primary justification for plant Species of Local Concern within the Mackey Road Relocation analysis area.

Evaluated Species	Effects Determination		Justification
	Alternative 1*	Alternative 2	
Lemon scent	No impact	<i>May impact individuals but not likely to result in a loss of viability in the planning area nor cause a trend towards listing as a Region 2 sensitive species</i>	A maximum of 65.78 acres of suitable habitat will be lost within the construction corridor; 41.31 acres of suitable habitat within the analysis area will not be impacted.

* Effects under the No Action alternative will be due to the continued presence of other non-coal related activities.

Alternative 1: No Action

Under the No Action alternative, the existing alignments of the Mackey County Road and the directly adjoining segment of the Temporary Reno Road will be retained, and no new road construction will occur. Mining will not occur under the approximately 6.1 miles of the existing Mackey County Road and 2.2 miles of existing Temporary Reno Road within the NARM permit area.

The No Action alternative for the Mackey Road Relocation project will have no new impacts on plant Species of Local Concern.

Alternative 2: Proposed Action

The Proposed Action will directly impact a maximum of 65.78 non-contiguous acres of suitable lemon scent habitat within the construction corridor. No individuals or populations were discovered in the analysis area during surveys conducted in 2006 or annually from 2010 through 2012. Habitat loss within the construction corridor should be considered permanent because current reclamation techniques do not adequately restore it. No other Region 2 plant Species of Local Concern will be impacted under the Proposed Action.

Potential indirect effects to suitable habitats within the construction corridor include increased erosion and/or sediment deposition during construction activities, resulting in habitat loss or degradation. Dust deposition from vehicular traffic also has been shown to lower photosynthetic

rates, respiration, transpiration, and overall productivity in plants (Farmer 1993, Vardaka et al. 1995). After construction is complete, PPRM will reclaim the affected area in accordance with USFS regulations and requirements through the use of appropriate methods and seed mixes. The use of best management practices for erosion and sedimentation control, as needed, will minimize the potential for such impacts.

Soil disturbance resulting from the Proposed Action may create conditions suitable for noxious and invasive plant species to reproduce. As with sensitive plant species, the competitive ability of lemon scent is presumed to be lower than undesired plant species. Consequently, noxious and invasive species may outcompete any lemon scent present in the area, preventing it from becoming reestablished in weed dominated areas (Ladyman 2006, Handley and Heidel 2011). If a noxious weed invasion occurred within suitable habitat, any existing populations of lemon scent would likely be lost, resulting in changes in plant species composition and community type, and ultimately a loss of suitable habitat. A secondary threat from weed invasion is alteration of the existing fire regime, as described previously. Such changes may exceed the fire tolerance of lemon scent. As noted, the use of best management practices during construction and reclamation efforts will help control the possibility for noxious and invasive species to become established. Upon project completion, Campbell County will be responsible for long-term control of noxious and invasive species within the final right-of-way.

Cumulative Effects for the Proposed Action

Cumulative effects are described as the effects of the Proposed Action when added to past, on-going, or reasonably foreseeable actions (36 CFR § 220.4 (f) of 07/24/08).

The amount of suitable lemon scent habitat present within the TBNG or range-wide has not been quantified, nor has the total amount of such habitat lost or degraded due to human-caused disturbance and activities, including climate change. The Mackey Road Relocation project will add minimal additional impacts, as no individuals or populations were documented in the construction corridor and a maximum of 65.78 non-contiguous acres of suitable habitat will be permanently lost or degraded. That level of impact is presumed to comprise less than 1% of the potential suitable habitat across the PRB, but the actual percentage is unknown. Direct impacts to suitable habitat in the TBNG, PRB, and range-wide are currently associated with resource extraction, road construction/modification, recreational activities, urbanization, grazing, and noxious and non-native weed invasions. Such impacts can include destruction of suitable habitat, increased soil erosion and deposition from extensive removal of vegetation, soil compaction and resulting erosion from livestock trampling, increased deposition of dust from traffic, and noxious weed and non-native species invasions resulting from soil disturbance, transportation of weeds seeds by human, animal, vehicle, and rail traffic. Indirect effects associated these activities result in the degradation and loss of suitable habitat range-wide. Global climate change resulting in increased erosion also could cause a loss of suitable habitat range-wide.

Determination of Effects and Rationale

Assuming presence in the general vicinity, the No Action alternative will result in **no loss of viability** for plant Species of Local Concern due to the absence of individuals during targeted surveys.

Assuming presence in the general vicinity, the Proposed Action also will result in **no loss of viability** for plant Species of Local Concern due to the absence of individuals in the construction corridor.

Significance of Effects for Species of Local Concern

Significance, as used in NEPA analyses, requires considerations of both context and intensity (40 CFR §1508.27). The effects disclosed above are **not considered to be significant** based on the limited context and intensity of the Proposed Action. Additional details regarding this aspect of the analysis are provided in the vegetation BA/BE/Species of Local Concern report, on file with the Douglas Ranger District office.

Viability Analysis, Risk Assessment, and Rationale

Viability concerns are unlikely for lemon scent due to the presence of suitable, but unoccupied, habitat within the vegetation analysis area (Table 3-12). No populations or individuals were documented during targeted surveys conducted in 2006 and annually from 2010 through 2012. Therefore, the Proposed Action **will not cause a trend toward federal listing**.

Table 3-12. Summary of viability analyses for plant Species of Local Concern for the Mackey Road Relocation project.

Common Name	Scientific Name	Status	Viability Determinations	
			No Action	Proposed Action
lemon scent	<i>Pectis angustifolia</i>	SLC	No impact	May impact habitat but not likely to result in a loss of viability in the planning area nor cause a trend towards listing as a Region 2 species of local concern.

SLC = Species of Local Concern

Short-Term Use/Long-Term Productivity, Unavoidable Adverse Impacts, Irreversible or Irretrievable Impacts on Vegetation Resources

No loss in long-term productivity of plant species is expected under either alternative.

No unavoidable adverse effects on plant species are expected under either alternative.

The No Action alternative will have no new irreversible or irretrievable impacts on vegetation resources. The Proposed Action will result in the irreversible and irretrievable loss of a maximum of 31.56 non-contiguous acres of suitable Barr's milkvetch habitat, and 65.78 non-contiguous acres of suitable common twinpod and lemon scent habitats. A potential population of approximately 10-15 Barr's milkvetch individuals will be lost as a result of the proposed action. No populations or individuals of common twinpod or lemon scent will be lost as a result of the Proposed Action.

3.6 Soils

Existing Conditions

Currently, the majority of the project area is undisturbed and in a relatively native condition. Some minor surface disturbances originating from livestock grazing, utility lines, road crossings, and communication lines are present. Conventional oil and gas development and surface coal mines occur in the vicinity, but are located outside the proposed project area (construction corridor) itself.

Potentially unstable soils within the TBNG have slopes of 25-40% and unstable soils have slopes greater than 40%. Both areas are generally considered as no surface occupancy areas for oil and gas development stipulations, although the application of those stipulations for non-oil and gas projects is unknown.

According to the TBNG soil classification system, the following mapping units present within the construction corridor are considered potentially unstable: Hilight-Wags-Badland complex, 3-45% slopes; Ustic Torriorthents-Badland complex, 10-100% slopes; Wibaux-Wibaux, thin solum complex, 6-40% slopes; and Wibaux-Shingle-Badland complex, 6-60% slopes. These potentially unstable mapping units are located along the construction corridor in T42N, R69W, NWNE Section 17, and along the east-central and southeastern portions of Section 6. Table 3-13 provides a summary of soil series and map units found along the construction corridor, as well as their selected erosion hazards as identified by the NRCS. Table 3-14 provides the NRCS ratings and limitations for local roads, streets, and road fill.

No unstable mapping units were identified along the construction corridor and no detrimental soil removal outside the project boundaries will result from the proposed project. Soil removal in any continuous area outside the project boundaries will not exceed 100 square feet, and the percentage of detrimentally compacted, eroded, and displaced land will not exceed 15% of the activity area (FSH 2509.18, USFS 2003b). The expected percentage of detrimentally impacted soils is 0%. This is due to the exemption of all permanent transportation systems in the 15% ruling and because all short term disturbances caused by construction will be reclaimed or mitigated. It is possible that project activities may result in detrimentally impacted soils in areas where major

Table 3-13. Summary of soil series and map units found along the proposed Mackey Road Relocation construction corridor, as well as their selected erosion hazards as identified by the NRCS.

Map Symbol	Map Unit Description	Landform	Drainage Class	Series Textural Class	Parent Material	Water Erosion Hazard	Wind Erosion Hazard
102	Arvada, thick surface-Arvada-slickspots complex, 0-6 % slopes	Alluvial fan, fan remnant	Well drained	Fine	Alluvium derived by calcareous shale	Slight	Severe
109	Bidman loam, 0-6% slopes	Alluvial fan, fan remnant	Well drained	Fine	Alluvium derived by calcareous shale	Slight	Moderate
111	Bidman-Parmleed loam, 0-6% slopes	Hill, ridge	Well drained	Fine	Alluvium derived by calcareous shale and alluvium over residuum weathered by calcareous shale	Slight	Moderate
112	Bidman-Parmleed loam, 6-15% slopes	Hill, ridge	Well drained	Fine	Alluvium derived by calcareous shale and alluvium over residuum weathered by calcareous shale	Severe	Moderate
116	Cambria-Kishona-Zigweid loams, 0-6% slopes	Alluvial fan, fan remnant	Well drained	Fine-loamy	Sandstone and shale	Slight	Moderate
119	Clarkelen-Embry fine sandy loams, 0-4% slopes	Floodplain, stream terrace	Well drained	Coarse loamy	Alluvium derived from sandstone or shale/ alluvium and/or eolian deposits from sandstone	Slight	Severe
143	Felix clay, ponded, 0-2% slopes	Playas, depressions	Poorly drained	Very fine	Alluvium derived from shale	Moderate	Moderate
144	Forkwood loam, 0-6 % slopes	Alluvial fan, fan remnant	Well drained	Fine-loamy	Sandstone and shale	Slight	Moderate
153	Haverdad-Kishona association, 0 to 6% slopes	Floodplain, stream terrace	Well Drained	Fine-loamy	Alluvium derived from sandstone and shale	Slight/Moderate	Moderate
163	Hilight-Wags-Badland complex, 3-45% slopes	Hills, ridges, breaks	Well drained	Clayey/Fine	Residuum or alluvium over residuum weathered from acid shale	Severe	Moderate
173	Lawver-Teckla-Wibaux complex, 0-6 % slopes	Mesa, terrace	Well Drained	Loam/Very fine sandy loam/Very channery loam	Alluvium and/or eolian deposits over residuum weathered from porcellanite	Slight	Slight/Moderate/Severe
175	Lawver-Wibaux complex, 6-30% slopes	Terraces, hills, ridges	Well drained	Fine/Loamy	Alluvium and or eolian deposits over residuum weathered from porcellanite	Slight/Severe	Slight/Moderate
190	Parmleed-Renohill complex, 3-15% slopes	Hill, ridge	Well drained	Fine	Alluvium over residuum weathered from calcareous shale	Moderate	Slight
200	Renohill-Savageton clay loams, 6-15% slopes	Hill, ridge	Well drained	Fine	Alluvium over residuum weathered from calcareous shale	Severe	Moderate
217	Theedle-Shingle loams, 3-30% slopes	Hill ridge	Well drained	Loamy/Fine loamy	Alluvium over residuum weathered from sandstone and shale	Moderate	Moderate
234	Ustic Torriorthents-Badland complex, 10-100% slopes	Hill, ridge	Well drained	Loamy/Fine loamy	Alluvium and/or residuum weathered from sandstone and shale	Severe	Severe
240	Wibaux-Wibaux, thin solum complex, 6-40% slopes	Hill, ridge	Well drained	Loamy	Alluvium and/or eolian deposits over residuum weathered from porcellanite	Moderate/Severe	Slight/Moderate
243	Wibaux, thick solum-Wibaux channery fine sandy loams, 3-40 % slopes	Hill, ridge	Somewhat excessively drained/ Well Drained	Channery fine sandy loam	Alluvium and/or colluvium over residuum weathered from porcellanite	Severe	Moderate
245	Wibaux-Shingle-Badland complex, 6-60% slopes	Hill, ridge	Well drained	Loamy	Alluvium and/ or eolian deposits over residuum weathered from porcellanite / residuum weathered from sandstone and shale	Severe	Slight/Moderate

Table 3-14. NRCS ratings and limitations for local roads and streets, and road fill.

Map Symbol	Map Unit Description	Local Roads and Streets	Limitation	Source of Road fill	Limitation
102	Arvada, thick surface-Arvada-slickspots complex, 0-6 % slopes	Severe	Low strength, shrink swell	Poor	Low strength, shrink swell
109	Bidman loam, 0-6% slopes	Severe	Low strength	Fair	Low strength, shrink swell
111	Bidman-Parmleed loam, 0-6% slopes	Severe	Low strength	Poor	Low strength, depth to rock
112	Bidman-Parmleed loam, 6-15% slopes	Severe	Low strength	Poor	Low strength, depth to rock
116	Cambria-Kishona-Zigweid loams, 0-6% slopes	Moderate/Severe	Low strength, shrink swell	Poor/Fair	Low strength, shrink swell
119	Clarkelen-Embry fine sandy loams, 0-4% slopes	Slight/Severe	Flooding	Good	N/A
143	Felix clay, ponded, 0 to 2% slopes	Very limited	Depth to saturated zone, shrink swell	Poor	Shrink swell, wetness depth, low strength
144	Forkwood loam, 0-6 % slopes	Severe	Low strength	Poor	Low strength
153	Haverdad-Kishona association, 0 to 6% slopes	Severe	Low strength, flooding	Poor	Low strength
163	Hilight-Wags-Badland complex, 3-45% slopes	Moderate/Severe	Low strength, shrink swell, slope, depth to bedrock	Poor	Low strength, shrink swell, depth to rock
173	Lawver-Teckla-Wibaux complex, 0-6 % slopes	Slight/Moderate/Severe	Shrink swell, large stones	Poor/Good	Large stones
175	Lawver-Wibaux complex, 6-30% slopes	Moderate/Severe	Shrink swell, slope, depth to bedrock	Poor/Good	Large stones
190	Parmleed-Renohill complex, 3 to 15% slopes	Very limited	Shrink swell, low strength	Poor	Depth to bedrock, low strength, shrink swell
200	Renohill-Savageton clay loams, 6-15% slopes	Severe	Low strength, shrink swell	Poor	Low strength, shrink swell, depth to rock
217	Theedle-Shingle loams, 3-30% slopes	Very limited	Depth to soft bedrock, too steep	Poor	Depth to bedrock, low strength, shrink swell
234	Ustic Torriorthents-Badland complex, 10-100% slopes	Moderate	Depth to rock	Poor	Depth to rock
240	Wibaux-Wibaux, thin solum complex, 6-40% slopes	Severe	Large stones, slope	Poor	Large stones
243	Wibaux, thick solum-Wibaux channery fine sandy loams, 3-40 % slopes	Severe	Large stones, slope	Poor/Fair	Large stones, slope
245	Wibaux-Shingle-Badland complex, 6-60% slopes	Severe	Large stones, slope, low strength	Poor	Large stones, slope, low strength, depth to rock

cut operations are required on steep hill slopes, but the necessary precautions will be made to mitigate potential erosion issues in those areas.

A search of the Campbell County hydric soils list was conducted to determine if hydric soils were present in the project area. Seven designated hydric soils are found along the construction corridor; however, the representative percent composition of each type is low: Bidman loam, 0-6% slopes; Bidman-Parmleed loam, 0-6% slopes; Cambria-Kishona-Zigweid loams, 0-6% slopes; Clarkelen-Embry fine sandy loams, 0-4% slopes; Arvada, thick surface-Arvada-slickspots complex, 0-6% slopes; Haverdad-Kishona association, 0 to 6% slopes; and Felix clay, ponded, 0-2% slopes. These map units are considered hydric soils due to inclusions of the Felix soil series, Boruff soil series, poorly drained soils, and frequently ponded soils. These hydric soil map units are found along the construction corridor in the following locations: T43N, R69W, SE¼ and SENE Section 30, and E½SE Section 31; T42N, R69W, SWSE Section 6, NWNE Section 7, NWSW Section 16, NE¼ and NESE Section 17, SESE Section 32, and SW¼ Section 33.

A total of approximately 6.64 non-contiguous acres of hydric soils were identified during the on-site field investigations conducted in June 2011. Hydric soils are located in the affected reaches of School Creek and Little Thunder Creek, two playas, one reservoir, and various depressional areas within dry ephemeral drainages. Table 3-15 in Section 3.7 (*Hydrology*) provides a complete listing of wetlands and hydric soils identified in the project area, as well as a detailed discussion of effects on these resources.

The soils present along the construction corridor consist mainly of fine, loamy, and fine loamy textures with the occasional coarse loamy texture. Soils in that area were identified primarily by associations or complexes of soil series, as well as some consociations and undifferentiated groups. The soil depths and types around the project area are similar to soils currently being salvaged and utilized for reclamation at the adjacent NARM and School Creek Mine.

Survey Methods

All soils information was derived in whole or part from the NRCS Web Soil Survey (USDA NRCS 2008a), NRCS Soil Data Mart (USDA NRCS 2008b), and the 2004 NRCS Soil Survey of Southern Campbell County, Wyoming (Westerman 1991). Site-specific information was gathered using recent 1:14,000 scale color, ortho-photography photographs from 2010 through 2012 vegetation surveys and maps of the proposed disturbance area. In addition, soils specialists reviewed GIS files identifying unstable soil areas for the TBNG. Those files were provided by the Douglas Ranger District.

Environmental Consequences (Effects Analysis)

Alternative 1: No Action

Under the No Action alternative, the existing alignments of the Mackey County Road and the directly adjoining segment of the Temporary Reno Road will be retained, and no new road construction will occur. Mining will not occur under the approximately 6.1 miles of the existing

Mackey County Road and 2.2 miles of existing Temporary Reno Road within the NARM permit area.

The No Action alternative will have no new impacts on soils in the project area.

Alternative 2: Proposed Action

The Proposed Action will impact approximately 292.7 acres on NFS lands during construction, with approximately 85.7 acres of NFS lands impacted by the final right-of-way alignment. All construction disturbance on NFS lands will occur within a 300-foot to 700-foot wide corridor. Surface disturbance within these corridors will include: overland travel of vehicles and equipment; topsoil removal, stockpiling, and replacement; cut/fill activities; road base placement and compaction; gravel surfacing; fencing; and reclamation of ancillary areas. Any yard area needed for temporary storage of construction materials or equipment staging areas will be located within the construction corridor or on privately-owned or leased surface. The completed road will have a right-of-way width of approximately 100 feet.

Areas located between the final right-of-way corridor and the outer edges of the construction corridor will have no long-term detrimental impacts due to planned reclamation management. Appropriate methods and seed mixes will be used to reclaim disturbed areas outside the final road easement. During the re-vegetation process, noxious weeds will be monitored and controlled to minimize impacts on soil productivity. Long-term impacted areas exist entirely within the planned permanent transportation system and are not considered detrimentally impacted areas per FSH 2509.18 (USFS 2003b).

Steep slopes are an issue for approximately 0.5 mile through T42N, R69W, NE¼ Section 7 and SE¼ Section 6. The construction corridor in these areas will be 700 feet wide, and will likely include major cut/fill construction. Topsoil and suitable subsoil (as defined by WDEQ-Land Quality Division Guideline #1 - Topsoil and Overburden) will be removed only from the disturbed area (cut/fill zones) within the corridor and replaced on the road and ditch slopes. After stripping of topsoil and subsoil to the intended grade, the remaining subsoil will be compacted (if bedrock has not been reached) prior to the laying of road foundation. In areas where hills are cut through, the man-made channel will collect runoff rain water and soil fines. Both compaction of subsoil and natural increase in fines will lead to slower infiltration rates in the areas immediately to either side of the road. Soil disturbances will also extend outward to a distance sufficient enough to create an angle of incline smaller than the potential angle of repose.

Detrimental wind and water erosion may be experienced both in cut hill slopes and the area immediately surrounding the road if immediate steps are not taken to protect the soil (Shukla 2004). Slope erosion will be controlled by the use of slope angle reduction, re-application of topsoil, re-vegetation, and, possibly, the use of mechanical runoff control features such as contour ditches, drop structures, etc. Minimizing the areas of soil disturbance and stabilizing disturbed areas by utilizing silt fences, straw bale dikes, mulching, and other means will further reduce potential impacts. Erosion in areas next to the road will be minimized by reducing the velocity of runoff water. Slope angles will be reduced to the extent possible in ditches to control drainage velocity and will be supplemented with mechanical control devices such as rip-rap, geo-web filled with rock or concrete, drainage culvert armoring and slope paving, and check dams.

Removing vegetative cover and topsoil generally increases the amount and speed of runoff. Re-establishing vegetative cover as quickly as possible and keeping slopes and ditches as gentle as possible are critical to keep erosion at a minimum. The timing of the project during fall and winter, when frequent and heavy rainfall are least expected, will further reduce potential impacts from erosion and sedimentation.

Engineered drainage structures consisting of multiple corrugated metal pipe or concrete box culverts will be installed to maintain post-construction habitat connectivity and prevent down-cutting and head-cutting where the road will cross Little Thunder Creek and School Creek. Installation of the culverts will be done when water in the streambeds is at a low level (i.e., fall/winter) to minimize impacts. Riprap will be placed at the culvert's inlet and outlet and bank cuts will be re-vegetated immediately to protect against erosion.

As with any major road project, a Stormwater Pollution Prevention Plan permit will be obtained by the construction contractor and will remain in force until the construction area has been adequately re-vegetated and the slopes and ditches are fully stabilized. This will help prevent sedimentation of wetlands and other water resources by erosion. In addition, the prime contractor will be required to provide a 1 year warranty to Campbell County against any construction deficiencies.

Access to the construction area will be from existing roads and two-tracks or from within the new corridor as it is built. Access to sources of construction water may require surface pipelines and pumps to be delivered via light vehicles and laid across native ground surface on NFS lands. Such access and activities will be limited to existing roads or the use of surface pipelines carefully installed across public land to avoid excessive disturbance of native ground surfaces. Therefore, potential impacts to soils outside the construction corridor will be minimal and temporary. The net long-term soil loss should only result from two sources: soil contained underneath the new road; and any erosional losses caused during the construction process prior to implementation of permanent management plans. Any disturbance, whether from compaction by machinery or in areas of cut or fill, will not cause long-term detrimental impacts due to planned reclamation efforts.

Any area of soil immediately below the road and foundation will be unavailable for any biological production. The area of soil from the edge of the road to the disturbed edge of any cut hillslopes will be mostly unavailable for sustained biological production, depending on ground cover type. Areas of soil next to the road that are not cut into hillsides will be reclaimed using appropriate methods and seed mixtures. Direct biological impacts to soil resources in the immediate area of construction activity will include short-term reduction in soil organic matter, microbial populations, seeds, bulbs, rhizomes, and live plant parts (Ingram 2005).

The success of the nearby mine reclamation in similar soil types demonstrates that natural vegetation production and cover can be returned to acceptable and/or near natural amounts through proper reclamation practices.

Cumulative Effects for the Proposed Action Alternative

Under the Proposed Action, the following cumulative effects on soil resources are possible:

- Increased wind and water erosion (Shukla 2004)
- Degradation of suitable salvaged material to be used for reclamation (Bendfeldt 2001, Ingram 2005, Shukla 2005, Zipper 2011).

The Proposed Action will result in approximately 85.7 additional acres of permanent disturbance upon completion and transfer of the road easement to Campbell County. Ongoing incremental losses of soil resources occur in the general vicinity as operations at nearby coal mines encroach into existing approved disturbance areas, with some soil being taken out of production in those areas until reclamation is established. Other impacts have already occurred and will continue to occur from mineral extraction processes such as oil and gas (conventional and CBNG) exploration and development, and their associated infrastructure. Conventional oil and gas development, ranching, and recreational activities are expected to contribute minimally to cumulative impacts to soil resources due to the relatively limited nature and/or scope of those activities.

The use of best management practices for erosion and sedimentation control, as well as appropriate reclamation methods and seed mixes, during and after construction will prevent or minimize potential impacts to soils within the Mackey Road Relocation project area. The application of LRMP Standard and Guidelines, appropriate project design criterion, and existing monitoring and mitigation measures required for development of federal coal minerals and oil and gas reserves in the area effectively protect existing soil resources on federal surface. When proper steps are taken to ensure the salvage and protection of topsoil and suitable subsoil during road construction, impacts to seedbed material quality and quantity can be minimized. As a result, cumulative effects are not expected to cause insurmountable impacts on the soil resource.

Determination of Effects and Rationale

The No Action alternative will have **no impact** on soils resources in the project area.

The Proposed Action will have **no impact** on unstable mapping units and **no detrimental soil removal** outside the project boundaries. The percentage of detrimentally compacted, eroded, and displaced land **will not exceed 15%** of the activity area. The Proposed Action **will impact** limited quantities of potentially unstable and hydric soils, but those impacts will be minimized by the use of appropriate best management practices for erosion control, soil compaction, and revegetation, or mitigated per regulatory requirements.

Short-Term Use/Long-Term Productivity, Unavoidable Adverse Impacts, Irreversible or Irretrievable Impacts on Soils Resources

No loss in long-term productivity is expected under either alternative.

No unavoidable adverse effects are expected under either alternative.

No new irreversible or irretrievable impacts on soils resources will occur under the No Action alternative. The Proposed Action will result in irreversible and irretrievable impacts on approximately 85.7 of soil that will be beneath the final right-of-way.

3.7 Hydrology

Existing Conditions

Ground Water

The general Mackey Road Relocation area contains three water-bearing geologic units: the recent alluvial deposits, Wasatch Formation overburden, and the Wyodak or Wyodak-Anderson coal seam (in descending order). The underlying, sub-coal Fort Union Formation and the Lance Formation-Fox Hills Sandstone aquifer serve as a water supply for existing coal mines within the Mackey Road area. However, no groundwater disturbance is expected from surface construction of Mackey Road. Detailed information describing regional and site-specific baseline hydrogeologic environments for the project area and immediate vicinity is available in the NARM and School Creek Mine WDEQ mine permits, on file with WDEQ in Sheridan or Cheyenne, Wyoming, as well as the Wright Area Coal LBA Final EIS, available from the BLM High Plains District Office in Casper, Wyoming.

The alluvial aquifer for recent deposits in Little Thunder receives recharge from three primary sources: the infiltration of precipitation; lateral movement of groundwater that discharges from the adjacent Wasatch Formation overburden; and infiltration of surface flow within the stream channel. The quality of alluvial groundwater in Little Thunder Creek is suitable for livestock and wildlife use, but the concentration of sulfate typically exceeds the agricultural use standard.

The Wasatch Formation is recharged from the infiltration of precipitation and surface water stored in playas and in-channel reservoirs, and from lateral movement of water from adjacent scoria bodies. Groundwater is typically discharged from the formation by evaporation and transpiration, pumping wells, drainage into mine excavations, and seepage into the alluvium along stream courses. Groundwater movement through the formation typically follows the topography of the area, with low overall hydraulic conductivity and low flow rates. Because the water-bearing units within this formation are not continuous, the Wasatch Formation is not considered as a regional aquifer. The quality of groundwater in the Wasatch Formation is highly variable and generally poor. This formation provides limited groundwater for livestock and domestic uses on a local scale, provided the water quality is suitable.

The Wyodak coal seam is considered a regional aquifer because it is water-bearing and laterally continuous throughout the area. The hydraulic conductivity within this coal seam is highly variable; recharge occurs primarily through infiltration of precipitation. In general, groundwater flows from east to west, following the natural dip of the coal seam deeper underground as it moves west from the PRB. Monitoring conducted by local coal mines over the last 25 years indicates that groundwater levels and flow directions in the Wyodak coal seam have been greatly influenced (i.e., decreasing) by surface mine dewatering and groundwater discharge associated with CBNG development (Wright Area Coal LBA Final Environmental Impact Statement 2010). Groundwater from coal seams is typically suitable only for livestock and wildlife because concentrations of certain substances often exceed many suitability criteria for domestic uses. The water also may have high salinity and sodium levels that make it unsuitable for agricultural uses.

Surface Water

The Mackey Road Relocation project area is primarily located in the Cheyenne River Basin watershed. Little Thunder Creek and one of its tributaries, School Creek, provide the main surface drainage within the Mackey Road Relocation project area. Little Thunder Creek drains into Black Thunder Creek, a major tributary of the Cheyenne River. The relocated Mackey Road crosses Little Thunder Creek in T43N, R69W, NESE Section 30, and crosses School Creek in T43N, R69W, SESE Section 31. Engineered drainage structures consisting of multiple corrugated metal pipe or concrete box culverts will be installed to maintain post-construction habitat connectivity and prevent down-cutting and head-cutting where the road will cross Little Thunder Creek and School Creek. No other diversions or other impacts to streams or other bodies of water are anticipated.

Little Thunder Creek and all of its tributaries are ephemeral. The creek is recharged primarily from convective thunderstorm runoff and, to a lesser extent, snowmelt runoff in the spring. Like most streams in the area, Little Thunder Creek also receives CBNG discharge water. Despite the additional water influx, mean annual rates of stream flow and discharge volume in the channel have remained relatively unchanged in recent years due to an extended drought period in the PRB since 1999. The WDEQ has classified Little Thunder Creek downstream of its confluence with North Prong Little Thunder Creek as a 2ABww stream that is protected for drinking water, aquatic life (a “ww” notation indicates a warm water fishery), recreation, wildlife, agriculture, industry and scenic value. Class 2AB waters are those known to support game fish populations at least seasonally and unless shown otherwise, are presumed to have sufficient water quantity and quality to support drinking water supplies and are protected for that use. School Creek is classified as Class 3B (non-drinking water/non-fish supporting).

Alluvial Valley Floors

Alluvial valley floors (AVF) are defined in WDEQ regulations as unconsolidated stream-laid deposits where water availability is sufficient for sub-irrigation or flood irrigation agricultural activities. The identification of AVFs requires detailed studies of the geomorphology, soils, hydrology, vegetation, and land use. For any designated AVF, regardless of its significance to agriculture, it must be demonstrated that the essential hydrologic functions will be protected. Investigations have been conducted in the area of the Mackey Road Relocation project by various mining companies. A significant AVF was identified near the confluence of North Prong Little Thunder Creek and Little Thunder Creek. Additionally, the portion of School Creek in T42N, R69W, Section 7 and T42N, R70W, Section 12 was identified as an AVF. Construction activities associated with the Mackey Road relocation are located several miles from these AVF's and no impact to them is anticipated.

Wetlands

Wetlands are aquatic features characterized by three specific components: hydric soils, a dominance of hydrophytic plants, and wetland hydrology. These areas are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support a vegetation community typically adapted for life in saturated soil conditions. Wetlands generally include

swamps, marshes, bogs, and similar areas. These sites are typically highly productive and diverse, and provide habitat for many wildlife species. Wetlands play an important role in controlling floodwaters, recharging groundwater, and filtering pollutants (Niering 1985).

Field observations were conducted within the wetlands analysis area (proposed road corridor and a 1,000-foot buffer; 500 feet either side of center) on June 2 and 6, 2011 and May 22, 2012 to assess all potential wetland areas within the analysis area. The survey spanned two years to accommodate the reroute of the southern end of the alignment in 2012. Surveys included creeks, drainages, reservoirs, playas, and depressional areas for indications of wetland hydrology, a dominance of hydrophytic vegetation, and the presence of hydric soils. All potential wetland areas throughout the entire analysis area were visually inspected for indications of wetland hydrology and hydrophytic vegetation while intrusive sampling was conducted to determine occurrence of hydric soils for analysis of wetland occurrence.

Wetlands identified in the analysis area are listed in Table 3-15. Wetlands (areas meeting all three parameters) occurred in School Creek, Little Thunder Creek, three playas, two reservoir areas, and in isolated depressional areas in unnamed, vegetated, dry ephemeral drainages. All wetlands in the analysis area have been grazed at times, indicating their ephemeral nature. A total of approximately 6.6 non-contiguous acres of wetlands are present in the Mackey Road analysis area (right-of-way and 1,000-foot buffer): 0.5 acre of Palustrine Aquatic Bed (PAB); 1.5 acres of Palustrine Emergent (PEM) Marsh; and 4.6 acres of PEM Wet Meadow. Many of those wetland areas are on the fringes of stock ponds due to the limited presence and occurrence of saturated areas.

Approximately 3.99 non-contiguous acres of wetlands were delineated on NFS lands within the analysis area. No Other Waters of the U.S. were identified in that area; channels not identified as wetlands consisted of vegetated channels lacking ordinary high water marks.

Jurisdictional determination lies with the USACOE. That agency determined that Little Thunder Creek and adjacent wetlands are the only waters of the United States within the Mackey Road Relocation corridor (USACOE letter dated October 17, 2012). Those wetlands are on private surface at the northern end of the analysis area, and encompass a total of 1.4 acres. However, only 0.15 acre of jurisdictional wetlands will be affected by the proposed project. Due to the lack of other viable options for the road corridor, it is not possible to further reduce that impact.

Environmental Consequences (Effects Analysis)

Alternative 1: No Action

Under the No Action alternative, the existing alignments of the Mackey County Road and the directly adjoining segment of the Temporary Reno Road will be retained, and no new road construction will occur. Mining will not occur under the approximately 6.1 miles of the existing Mackey County Road and 2.2 miles of existing Temporary Reno Road within the NARM permit area.

The No Action alternative will have no new impact on existing water resources, AVFs, or wetlands in the Mackey Road Relocation analysis area.

Table 3-15. Summary of Waters of the U.S. Classifications in the Mackey Road Relocation analysis area.

Feature ID	Cowardin Classification				
	General Description	Palustrine			Total (acres)
		Aquatic Bed (PAB) (acres)	Emergent (PEM) Marsh (acres)	Emergent (PEM) Wet Meadow (acres)	
P1	Channel Depressional Area	---	---	0.011	0.011
P2-P5	Channel Depressional Areas	0.057	0.003	---	0.060
P8	Reservoir	0.042	0.007	0.086	0.135
P9	Channel Depressional Area	---	---	0.103	0.103
P10	Playa	0.151	0.061	0.413	0.625
P11	Channel Depressional Area	---	---	0.012	0.012
P12	Channel Depressional Area	---	---	0.088	0.088
10	Playa	0.010	---	1.557	1.567
11	Playa	0.009	---	1.472	1.481
14	Little Thunder Creek	0.020	0.380	0.418	0.818
15	Little Thunder Creek	---	0.500	0.122	0.622
17	Channel Depressional Area	0.002	---	---	0.002
18	School Creek	0.225	0.500	0.319	1.044
19	Reservoir Tail	---	0.038	0.031	0.069
Total (Acres)		0.516	1.489	4.632	6.637

--- Does not occur or is <0.001 acre.

Alternative 2: Proposed Action

The Proposed Action will have no impact on ground water or AVF resources. This action will have a minor, temporary impact on surface water resources and a moderate, permanent impact on approximately 0.15 acre of jurisdictional wetlands associated with Little Thunder Creek. That portion of Little Thunder Creek is on private surface. No jurisdictional wetlands will be affected on NFS lands.

Installation of culverts will occur during low flow to minimize impacts to surface water. All wetland functions will be lost in areas disturbed during construction activities. Per the USACOE, these impacts will be mitigated during reclamation by creating equivalent (i.e., 1:1 ratio) acreages of wetlands immediately adjacent to the Mackey Road Relocation area. The agency determined that such a ratio is appropriate for this project due to the proximity of the proposed mitigation site to the disturbance area. As directed by the USACOE, determination of

the jurisdictional wetland acreage to be affected and construction drawings for mitigation areas will be prepared as part of the Nationwide Permit 14 application and approval process. That permit will be obtained prior to disturbance.

Soil erosion and runoff are expected during construction. An authorization under the Wyoming General Permit for Large Construction Projects (greater than 5 acres) will be obtained prior to the start of construction and maintained until termination is allowed by the WDEQ/Water Quality Division. The use of appropriate best management practices under that permit will minimize the potential for such impacts. Engineered drainage structures consisting of multiple corrugated metal pipe or concrete box culverts will be installed during low flow to maintain post-construction habitat connectivity and prevent down-cutting and head-cutting where the road will cross Little Thunder Creek and School Creek. No other diversions or other impacts to streams or other bodies of water are anticipated. An increase in noxious and invasive weed species occurrence due to increased traffic and soil disturbance within the project area is expected. The increase in noxious weeds could impact the wetland plant communities. However, during construction, control of noxious and invasive species will be performed by the contractor. After construction is complete, Campbell County will control noxious weeds.

Cumulative Effects for the Proposed Action

No new cumulative impacts will affect groundwater, AVF, or jurisdictional wetland resources on NFS lands in the area due to their physical characteristics or absence from the area. Existing activities on roads within the project area may result in minor sedimentation or runoff into surface water within Little Thunder Creek at the existing crossing on private surface. Existing activities also could introduce noxious weeds into the existing area or new road corridor, which could affect wetland resources. Reclamation activities outside the final road corridor will be done using best management practices and per USFS regulations and requirements.

Under the Proposed Action, approximately 0.15 acre of jurisdictional wetlands will be impacted by road construction activities; that disturbance will occur on private surface. Per the USACOE, a Nationwide 14 Permit Application will be obtained prior to disturbance and PPRM will mitigate all affected jurisdictional wetlands in accordance with section 404 of the Clean Water Act.

Per the USACOE, mitigation will occur at a 1:1 ratio for jurisdictional wetlands due to the location of the mitigation site immediately adjacent to the disturbance area. The wetland replacement plan, which must be approved by the USACOE, requires no net loss of wetland area and function.

Determination of Effects and Rationale

The No Action alternative will have **no effect** on water, AVF, or wetland resources in the project area.

Implementation of the Proposed Action will result in **moderate, permanent impacts** to potentially jurisdictional wetlands on private surface in the analysis area. Replaced wetlands (jurisdictional or functional) may not duplicate the exact function and landscape features of the

pre-disturbance wetlands, but all wetland replacement plans will be approved by the USACOE, which has special required permitting procedures to assure that no net loss of wetlands will occur after reclamation.

Short-Term Use/Long-Term Productivity, Unavoidable Adverse Impacts, Irreversible or Irretrievable Impacts on Hydrological Resources

No loss in long-term productivity is expected under either alternative.

No unavoidable adverse effects are expected under either alternative.

No irreversible or irretrievable impacts on hydrological resources will occur under either alternative.

3.8 Land Use

Existing Conditions

The Mackey Road Relocation project area includes a mix of private, state, and federal lands. Livestock grazing (sheep and cattle) on native rangeland is currently the primary land use in the project area itself. Secondary uses on all lands include oil and gas production (conventional and CBNG), wildlife habitat, communication and power lines, transportation (road and rail), and recreation (mainly big game hunting). No fisheries are present and no public fishing opportunities are available in the Mackey Road Relocation project area or surrounding area. Surface mining and its related infrastructure are present immediately west of the project area, and will continue to move north and west. The existing alignment of the Mackey Road through the NARM permit area allows access to NFS, state, and private lands in the general project area from the west, but access to the project area itself is quite limited at present. This relative isolation provides a somewhat secluded setting for hunting, hiking, and other recreational activities, though mine operations are visible and/or audible from much of the project area.

Environmental Consequences (Effects Analysis)

Alternative 1: No Action

Under the No Action alternative, the existing alignments of the Mackey County Road and the directly adjoining segment of the Temporary Reno Road will be retained, and no new road construction will occur. Mining will not occur under the approximately 6.1 miles of the existing Mackey County Road and 2.2 miles of existing Temporary Reno Road within the NARM permit area.

The No Action alternative will have no new impact on existing land uses in the Mackey Road Relocation analysis area.

Alternative 2: Proposed Action

The Proposed Action will have limited impacts on existing land uses in the project area. The primary land use (agricultural) may experience a minor (85.7 acres, long-term) reduction in grazing habitat due to the new alignment. However, coordination with grazing permittees post-construction will ensure optimum placement of fences and gates to maintain logical grazing

pasture delineations, water availability, and general access in the area. The improved road conditions also may allow ranchers to transport their livestock more easily than on current two-track roads. The USFS estimates a loss of approximately 14 animal unit months, which it does not consider burdensome. Hunting and hunting access will be permanently affected as the new county road is expected to provide easier motorized access to some public lands within the TBNG not currently readily accessible to the general public except by hiking into the area. Some hunters will like the easier access, though others may be disappointed that previously remote areas will have an upgraded road dissecting the landscape. Activities near road segments to be vacated are ongoing, and procedures are currently in place to address displaced activities such as grazing, wildlife use, and other non-mine energy operations.

Cumulative Effects for the Proposed Action

Cumulative impacts will occur under the Proposed Action due to the construction of a new county road where none currently exists, with reconstruction of a small portion of an existing county road in the northern portion of the project area. The Proposed Action will result in approximately 292.7 additional acres of short-term surface disturbance on NFS lands during construction, and approximately 85.7 additional acres of permanent disturbance upon completion and transfer of the road easement to Campbell County. However, that acreage is not considered a major influence when compared to existing approved and/or permitted activities. Access to existing land and infrastructure will be greatest under the Proposed Action. The project area falls entirely outside current and projected permit areas for nearby surface coal mines, thus providing a safer route through the area by avoiding areas where blasting, heavy equipment traffic, and other mine hazards regularly occur. Only approximately 14 animal unit months will be affected under the Proposed Action; the project will maintain and/or improve accessibility to pastures and water. Due to the nature of the proposed disturbance, the maintenance of public access within the general area, and the improved public safety under the Proposed Action, any impacts to grazing permits (forage, changes in allotments, etc.) or other land use aspects will be offset by the potential benefits. However, recreationalists seeking remote experiences will lose that opportunity to some extent due to the likely increase in traffic, noise, and dust that will accompany the finished road.

Determination of Effects and Rationale

The No Action alternative will have **no impact** on land use in the project area.

The Proposed Action will result in **minor, permanent impacts** on grazing operations (beneficial and detrimental), **moderate, permanent beneficial impacts** on public safety by avoiding active mine areas, and **moderate, permanent impacts** to unbroken landscapes sought by some recreationalists.

Short-Term Use/Long-Term Productivity, Unavoidable Adverse Impacts, Irreversible or Irretrievable Impacts on Land Use Resources

No loss in long-term productivity is expected under either alternative.

No unavoidable adverse effects are expected under either alternative.

No irreversible or irretrievable impacts on land use will occur under either alternative.

3.9 Air Quality

Background

The WDEQ administers a permitting program to assist the agency in managing the state's air resources. Under this program, anyone planning to construct, modify, or use a facility capable of emitting designated pollutants into the atmosphere must obtain an air quality permit to construct. Coal mines fall into this category. The WDEQ also requires annual monitoring data to document the air quality at all of the PRB coal mines. As a result, the eastern PRB is one of the most intensely monitored areas in the world. The most recent detailed descriptions of factors affecting air quality, the regulatory standards for various aspects of air quality monitoring at surface coal mines in the southern PRB, long-term monitoring results, and existing and likely future impacts to air quality variables are provided in the Wright Area Coal LBA Final EIS, available from the BLM High Plains District Office in Casper, Wyoming. The analyses performed and impacts discussed in that final EIS encompass the project area due to its overlap with LBA tracts for NARM. A summary of relevant factors for the Proposed Action and No Action alternative for this document is provided below.

Existing Conditions

Livestock grazing is the primary land use in the general project area, though surface coal mining occurs at multiple properties just west of the project area. Other land uses include oil and gas production (conventional and CBNG), wildlife habitat, power and communication lines, transportation (road and rail), and recreation (mainly big game hunting outside the permit areas). Those activities occur on all surface ownership.

Air pollution impacts are limited by various local, state, tribal, and federal air quality regulations, standards, and implementation plans. In Wyoming, air pollution impacts are managed by WDEQ's Air Quality Division (AQD) under the Wyoming Air Quality Standards and Regulations and the Environmental Protection Agency-approved state implementation plan. The WDEQ/AQD requires monitoring data to document the air quality at all of the PRB mines. Full details regarding air quality and associated regulations applicable to surface coal mining are available from the AQD and in the Wright Area Coal LBA Final EIS. Permit information specific to NARM is available from the WDEQ in Sheridan and Cheyenne, Wyoming.

Various factors influence the air quality of any region, including the magnitude and distribution of pollutant emissions, the regional climate (including prevailing wind direction), and the local topography. The Mackey Road relocation project is located beyond and east of the NARM permit area, in the east-central portion of the PRB, a part of the Northern Great Plains that includes most of northeastern Wyoming. As discussed previously, the topography in the project area is primarily rolling plains with limited areas of rougher terrain. The climate is semiarid, with relatively short warm summers and longer cold winters. Evaporation exceeds annual precipitation.

Air quality conditions in rural areas often are better than in large urban/industrial centers. Rural areas typically have a smaller number of emission sources and favorable atmospheric dispersion conditions which can result in relatively low air pollutant concentrations.

Fugitive dust particles are generated from a variety of mine-related operations and natural sources including, but not limited to, blasting, excavating, hauling, and similar activities, as well as wind erosion of disturbed and un-reclaimed mining areas. Large mining equipment produces particulate and gaseous tailpipe emissions that impact air quality downwind. Coal crushing, storage, and handling facilities are the most common stationary or point sources associated with surface coal mining and preparation.

Blasting occasionally produces gaseous, orange-colored clouds that contain nitrogen dioxide; these clouds result from the incomplete combustion of explosives used in the blasting process. Other types of air pollutant emission sources within the project area include:

- Nitrogen dioxide and particulate emissions from railroad locomotives;
- Carbon monoxide and nitrogen oxides from internal combustion engines used at natural gas and CBNG pipeline compressor stations;
- Carbon monoxide, nitrogen oxides, particulates, sulfur dioxide, and volatile organic compounds from gasoline and diesel vehicle tailpipe emissions;
- Particulate matter (dust) generated by vehicle travel on unpaved graded roads, agricultural activities such as plowing, and paved road sanding during the winter months; and
- Windblown dust and air pollutants transported from emission sources located outside the PRB.

Visibility is another component of air quality, and can be defined as the distance one can see and the ability to perceive color, contrast, and detail at great distances. Visual range (the farthest distance a person can see a landscape feature) is most often impaired by fine particulate matter suspended in the air due to natural (wind) or man-made surface disturbance.

Emission Sources

The PRB Coal Review generally considers existing air quality conditions at the coal mines and immediate region (including the project area east of the mines) to be very good. Due to its location east of the mines, the general area itself has limited air pollution emissions sources (e.g., industrial facilities, including the surface coal mines, and few residential emissions in relatively small communities and isolated ranches) and good atmospheric dispersion conditions.

Oxides of nitrogen (NO_x) include nitrogen dioxide (NO₂), nitrous acid (HNO₂), and nitric acid (HNO₃). The National Ambient Air Quality Standards (NAAQS) include NO₂, a component of NO_x. The available data show that the PRB complies with the ambient air quality standards for NO₂. Occasional high concentrations of carbon monoxide (CO) and particulate matter may occur in more urbanized areas (e.g., cities of Gillette, Sheridan, and Buffalo) and around

industrial facilities (e.g., surface coal mines and coal-fired power plants), especially under stable atmospheric conditions that occasionally occur during winter.

The primary direct source of gaseous emissions from surface coal mining operations is tailpipe exhaust from large mining equipment and other vehicle traffic inside the mine permit area. Additional sources of NO_x include blasting (overburden and coal) and emissions from the trains used to transport the coal away from the mine.

Under the Clean Air Act, the Environmental Protection Agency (EPA) has set protective health-based standards for ozone. Ground level ozone (O₃) is not emitted directly into the air, but is a secondary pollutant created by chemical reactions between oxides of nitrogen (NO_x) and volatile organic compounds (VOC) in the presence of sunlight. Emissions from industrial facilities, electric utilities, motor vehicle exhaust, gasoline vapors, and chemical solvents are some of the major sources of NO_x and VOC.

The WDEQ does not currently require O₃ monitoring at PRB coal mines, but has monitored levels at its ambient air quality monitoring sites in the PRB since 2001. During this period, no exceedances of the O₃ standard have occurred at any of these monitoring sites.

Particulate Emissions

Particulate matter (PM) is a complex mixture of small particles and liquid droplets that are suspended in the air. PM is made up of a number of components, including acids (nitrates and sulfates), organic chemicals, metals, and soil or dust particles. Fine particulates are those measuring 2.5 micrometers or less in diameter (PM_{2.5}). They are also a major cause of visibility impairment in many parts of the United States. While individual particles cannot be seen with the naked eye, with sufficiently high concentrations, they can appear as black soot, dust clouds, or haze.

Surface coal mining activities generate fugitive dust particulates and gaseous tailpipe emissions from large mining equipment. Specifically, activities such as blasting, excavating, loading and hauling of overburden and coal, and wind erosion of disturbed and unreclaimed mining areas produce fugitive dust. Coal crushing, storage, and handling facilities are the most common stationary or point sources for particulate matter associated with surface coal mining and preparation.

Historical data for particulate matter from monitoring efforts (i.e., NARM and other neighboring mines) that overlap the Mackey Road Relocation analysis area generally show the same results as for the PRB as a whole. No monitored exceedances of the annual standard for PM₁₀ or PM_{2.5} have occurred at NARM, to date.

Visibility

Visibility refers to the clarity with which scenic vistas and landscape features are perceived at great distances. That is, visibility can be defined as the distance one can see and the ability to perceive color, contrast, and detail. Fine particulate matter (PM_{2.5}) can be one of the primary

causes of visibility impairment. Visual range, one of several ways to express visibility, is the farthest distance a person can see a landscape feature. Pristine visual range is estimated to be about 140 miles in the western U.S. and 90 miles in the eastern U.S., without the impacts of human activity (EPA 2001).

Visibility impairment is expressed in terms of deciview (dv). The dv index was developed as a linear perceived visual change (Pitchford and Malm 1994) and is the unit of measure used in the EPA's Regional Haze Rule to achieve the National Visibility Goal. The goal was established as part of the Clean Air Act in order to prevent any future, and remedy any existing, impairment of visibility in mandatory Federal Class I areas that result from manmade air pollution. The dv index is a scale related to visual perception that has a value near zero for a pristine atmosphere. A change in visibility of 1.0 dv represents a "just noticeable change" by an average person under most circumstances. Increasing dv values represent proportionately larger perceived visibility impairment.

Prevention of Significant Deterioration (PSD)

Under requirements of the Clean Air Act, the EPA has established PSD rules that are intended to prevent deterioration of air quality. Increases in ambient concentrations of NO₂, SO₂, and PM₁₀ are limited to modest increments above the existing or "baseline" air quality in most attainment areas of the country (i.e., areas that have "attained" compliance with the adopted NAAQS for that pollutant). Increases in ambient concentrations of those pollutants are limited to very small incremental increases in pristine attainment areas.

For the purposes of PSD, the EPA has categorized each attainment area in the U.S. into one of three area classifications. PSD Class I is the most restrictive air quality category and applies to national parks and other federally designated areas. These Class I areas are "mandatory" in that they cannot be redesignated. Attainment areas defined as Class I at the request of a state or tribe (e.g., Northern Cheyenne Reservation) are considered "designated" Class I areas; this category is intended to protect air quality in areas of particular interest to the requesting entity. Designated Class I areas can be redesignated at the option of the requesting state or tribe. All remaining areas outside of mandatory or designated Class I boundaries are classified as Class II areas, which allow a relatively greater deterioration of air quality, although still within the NAAQS. No Class III areas, which allow further degradation, have been defined.

The closest mandatory Class I areas to the Mackey Road Relocation analysis area are Wind Cave National Park and Badlands National Park in South Dakota, located about 90 miles and 140 miles east of the project area, respectively. The closest designated Class I area is the Northern Cheyenne Indian Reservation (in Montana), located about 135 miles north-northwest of the analysis area. The closest sensitive areas are the Class II Devils Tower National Monument (70 miles to the north-northeast) and Jewel Cave National Monument (74 miles to the east).

An initial inventory of all point sources, controls, and emissions for the adjacent NARM air quality permit shows a maximum potential to emit of 40.2 tons per year. That level is below the 100 tons per year major source threshold limit specified in Chapter 6, Section 3 of the Wyoming Air Quality Standards and Regulations. Therefore, a PSD increment consumption analysis is not necessary for NARM, and the mine is not subject to PSD permitting. Further, surface coal mines

are not considered to be major emitting facilities in accordance with Federal and state regulations (40 CFR 52.21, WDEQ Chapter 6, Section 4). Therefore, Wyoming does not require mines to evaluate project air quality impacts, including Air Quality Related Values, on Class I areas.

Public Health and Safety

Recent public health and safety concerns in the PRB have largely focused on the potential for exposure to particulate matter and NO_x emissions from coal mining and related support activities (e.g., topsoil stripping), and the potential impacts of such exposures on the health of people living in the vicinity of surface coal mines located in the eastern PRB. Potential health risks associated with inhalation of particulate matter and NO_x include acute respiratory problems, aggravated asthma, decreases in lung capacity in some healthy adults, inflammation of lung tissue, respiratory-related hospital admissions and emergency room visits, and increased susceptibility to respiratory illnesses, including bronchitis and pneumonia. Public exposure to emissions caused by surface mining operations is most likely to occur sporadically along public roads and highways that pass by or through the area of mining operations.

Air pollution is controlled by state and federal air quality regulations and standards established under the federal Clean Air Act Amendments. All mines in the PRB are required to conduct air quality modeling to show that their proposed operations will comply with the state and national air quality standards, and they are also required to demonstrate through regular monitoring that their actual air emissions do not exceed those standards.

To date, no events of public exposure to NO₂ from blasting activities at the adjacent NARM have been reported. Therefore, the WDEQ has not required NARM to implement any specific measures to control or limit public exposure to NO₂ from blasting, although the mine has instituted voluntary blasting restrictions to avoid NO_x impacts to the public. Because the Mackey Road Relocation project will have considerably smaller potential impacts than NARM, both during construction and upon project completion, no such measures are anticipated for this project.

Power Plants

The use of the coal after it is mined is not determined at the time of leasing. However, the majority of the coal currently being mined in the Wyoming PRB is being used by coal-fired power plants to generate electricity for the United States. The mines in the southern PRB do not sell their coal to any local power plants.

Five coal-fired power plants are in the Wyoming PRB study area analyzed in recent BLM regional Task 1 and Task 2 analyses. Black Hills Power Corporation owns and operates the Neal Simpson Units 1 and 2 (21.7 megawatts [MW] and 80 MW, respectively), Wygen I and II (80 MW and 95 MW, respectively), and Wyodak (330 MW) power plants, all of which are located approximately 5.0 miles east of Gillette and approximately 56 miles north of the proposed Mackey Road Relocation project. An estimated 1,380 MW of new power plant production capacity is anticipated in the Task 2 study area by 2015.

Greenhouse Gas (GHG) Emissions and Global Climate Change

Climate change refers to any distinct change in measures of climate lasting for a long period of time. In other words, “climate change” means major changes in temperature, rainfall, snow, or wind patterns lasting for decades or longer. Climate change can result from:

- natural factors, such as changes in the sun’s energy or slow changes in the earth’s orbit around the sun;
- natural processes within the climate system (e.g., changes in ocean circulation); and/or
- human activities that change the atmosphere’s make-up (e.g., burning fossil fuels) and the land surface (e.g., cutting down forests, planting trees, building developments in cities and suburbs, etc.)
http://www.epa.gov/climatechange/downloads/Climate_Basics.pdf, EPA-430-R08-016).

Climatic change analyses are comprised of several factors, including greenhouse gas emissions, land use management practices, and other variables. Many GHGs occur naturally in the atmosphere, such as carbon dioxide (CO₂), methane (including CBNG), water vapor, ozone, and N₂O. Other GHGs are synthetic (i.e., man-made), such as chlorofluorocarbons, hydrofluorocarbons and perfluorocarbons, as well as sulfur hexafluoride. These GHGs are released into the atmosphere and prevent the escape of reflected solar radiation and heat from the earth’s surface.

The EPA states, “Emissions of greenhouse gases are typically expressed in a common metric so that their impacts can be directly compared, as some gases are more potent (have a higher global warming potential) than others. The international standard practice is to express greenhouse gases in CO₂ equivalents, or CO₂e. Emissions of gases other than CO₂ are translated into CO₂e using global warming potentials” (EPA 2005). GHGs are not currently regulated for emissions from minor sources such as surface coal mines.

Researchers are investigating opportunities for carbon sequestration, the process of carbon capture, separation, and storage or reuse, as a means to stabilize and reduce concentrations of CO₂. Direct options for carbon sequestration involve techniques to capture CO₂ at the source (e.g., power plant) before it enters the atmosphere. Captured CO₂ could then be used in other efforts such as enhanced oil recovery operations, for “value-added” sequestration. Indirect sequestration involves developing methods to integrate fossil fuel production and use with terrestrial sequestration and enhanced ocean storage of carbon. No carbon sequestration projects currently exist in the Wyoming PRB. However, CO₂ is being injected underground for the purpose of enhanced oil recovery near in the Salt Creek area near the town of Midwest, Wyoming.

Environmental Consequences (Effects Analysis)

Alternative 1: No Action

Under the No Action alternative, the existing alignments of the Mackey County Road and the directly adjoining segment of the Temporary Reno Road will be retained, and no new road

construction will occur. Mining will not occur under the approximately 6.1 miles of the existing Mackey County Road and 2.2 miles of existing Temporary Reno Road within the NARM permit area.

The No Action alternative will have no impact on NO_x, O₃, or PM₁₀ emissions within the project area, or on public health and safety related to such emissions.

Alternative 2: Proposed Action

The Proposed Action will directly impact air quality within the project area through increased vehicular traffic during construction of the relocated roadway. Those impacts will be short-term (approximately 5 months) and will decrease greatly once construction is complete. The relocation of an existing road rather than construction of a new additional road will further minimize new impacts, as existing traffic will move from one area to another rather than utilize both roadways simultaneously. However, it is expected that overall traffic levels will increase somewhat upon completion of the project.

Although coal extraction will not occur as part of the proposed project, it is a logical outcome upon completion of the road. Therefore, the Proposed Action will indirectly impact CO₂ emissions, GHGs, and climate change. The potential carbon sink capacity within the project area will be temporarily diminished by new surface disturbance under the Proposed Action; upland areas affected by the relocation may not create the same type of carbon sink as previously existed upon completion of the project.

Several other factors combine to minimize and/or mitigate such potential impacts from the Proposed Action. For example, mine operations (including the number of vehicles, speed limits, dust and other particulate emissions, etc.) will not increase as a result of the proposed project, though the location both of mine activities and their resulting effects will change as mining progresses through the vacated road alignments. No occupied residences are present within the project area. In addition, relocation of Mackey Road will reduce the public's exposure to blasting emissions and heavy equipment operations by relocating the county road west, and well beyond, existing coal leases.

Rigorous dust control, monitoring, and reclamation standards required by existing mine permits will be applied during and after construction, which will minimize potentially harmful emissions and particulates and their impacts on visibility in the project area and surrounding lands. WDEQ regulations require seeding of all topsoil piles to minimize erosion from wind and water, further reducing negative impacts to air quality. Long-term modeling and short-term monitoring for the nearby NARM and other neighboring mines indicate that similar mine activities currently projected to occur after the road is relocated will comply with NAAQS and state standards. USFS Standards and Guidelines also will apply.

Cumulative Effects

The project area falls entirely outside current and projected permit areas for nearby surface coal mines. The Proposed Action will result in approximately 292.7 acres of short-term surface disturbance on NFS lands during construction, and approximately 85.7 acres of permanent disturbance upon completion and transfer of the road easement to Campbell County. Existing

public access to private, state, and NFS lands will be maintained, with improvements to health and safety of individuals traveling throughout the project area by removing exposure to mine operations that produce various emissions and particulates. Surface disturbance outside the proposed project area, but in the vicinity, will result mainly from expansion of existing surface coal mines. Additional impacts have already occurred and will continue to occur from other mineral extraction processes, such as oil and gas (conventional and CBNG) exploration and development, and their associated infrastructure. The application of TBNG LRMP Standard and Guidelines, appropriate project design criterion, and existing monitoring and mitigation measures required for development of federal coal minerals, and oil and gas reserves in the cumulative impact analysis area will effectively protect existing air quality resources on federal lands.

Determination of Effects and Rationale

The No Action alternative will have **no effect** on air quality and related factors in the new project area.

The Proposed Action will result in **moderate, short-term impacts** to air quality and visual resources in the project area. Those impacts will be offset upon completion of the project when existing traffic shifts from the current alignment to the new alignment.

Short-Term Use/Long-Term Productivity, Unavoidable Adverse Impacts, Irreversible or Irretrievable Impacts on Air Quality Resources

No loss in long-term productivity is expected under either alternative.

No unavoidable adverse effects are expected under either alternative.

No irreversible or irretrievable impacts on air quality will occur under either alternative.

3.10 Economic and Social Conditions

The management of the TBNG has the potential to affect the local economies. People and economies are an important part of the ecosystem. Use of resources generate employment and income in the surrounding communities and counties, and generate revenues that are used to accomplish USFS objectives or are returned to the federal treasury.

This section summarizes the socioeconomic conditions and community resources in Campbell County, Wyoming, that make up the affected environment for socioeconomic resources. Specifically, this section addresses population, economic conditions, income, housing, local government facilities and services, and utilities. Further in-depth information for all socioeconomic conditions can be found in the Wright Area Coal LBA Final EIS, available from the BLM High Plains District Office in Casper, Wyoming.

Regulatory Framework

The preparation of NEPA documents is guided by Council on Environmental Quality regulations for implementing NEPA (40 CFR 1500-1508). NEPA requires that consequences to the human

environment be analyzed and disclosed. The extent to which these environmental factors are analyzed and discussed is related to the nature of public comments received during scoping. NEPA does not require a monetary benefit-cost analysis. If an agency prepares an economic efficiency analysis, then one must be prepared and displayed for all alternatives (40 CFR 1502.23).

The Office of Management and Budget Circular A-94 promotes efficient resource use through well-informed decision-making by the federal government. It suggests agencies prepare an efficiency analysis as part of project decision-making. It prescribes present net value as the criterion for an efficiency analysis.

The development of coal mining and mineral extraction is guided by agency direction found in USFS Manual 2800. FSH 2809.15 guides analyses for mineral and geology resource extraction, and FSH 2709.11 guides Special Use application and authorization processing.

Existing Conditions

Population

The project area is located in southern Campbell County. The City of Gillette and the town of Wright are the primary population centers in the area. According to the 2010 census (most recent), Campbell County's population estimate was 46,133. Gillette accounts for approximately 63% of the county's residents. That estimate represents an increase of approximately 48% since 2000, making Campbell County the third largest county in the state (Campbell County Economic Development Corporation 2011).

Employment and Economic Conditions

The major industries in Campbell County in 2010 were (in descending order): mining, the school district, the hospital, local government, mine support services, and retail. Table 3-16 presents a list of employment by employer for Campbell County in 2010 (Campbell County Economic Development Corporation 2011). Surface coal mining represents approximately 58% of the total employment and payroll in Campbell County, with Peabody Energy as the largest individual employer. Due to recent changes in the economy, the oil and gas industry has not been a major employer in the area for the last 3 years (2008-2010) (Campbell County Economic Development Corporation 2011).

The unemployment rate in Campbell County was 4.4% in the second quarter of 2011. That was one of the lowest rates in Wyoming, and was significantly lower than the average national rate of 9.1% (Campbell County Economic Development Corporation 2011).

Housing

Approximately 61% of the PRB coal mining employees were estimated to live in Gillette and surrounding areas, according to a 2001 report on housing needs; 14% were estimated to live in Wright and 25% were outside Campbell County (Pederson Planning Consultants 2001). Population growth since 2000 has prompted new housing construction in the region. During one recent period, construction did not keep pace with demand. Consequently, vacancy rates were at near record lows and housing prices have climbed in recent years (e.g., since 2005). Vacancy rates for rental units declined even more sharply than for homeowner units as a result of recent

Table 3-16. Major employers in Campbell County in 2010.

Employer	Number of Employees	Percent of Employees
Peabody Energy	1,936	18%
Arch Coal	1,750	16%
Campbell County School District	1,659	15%
Cloud Peak Energy	1,588	14%
Campbell County Memorial Hospital	1,000	9%
Alpha Coal West	657	6%
Campbell County	623	6%
Wal-Mart	540	5%
City of Gillette	278	3%
Buckskin Mining Company	370	3%
Hettinger Welding	225	2%
L&H Industrial	200	2%
P&H Mine Pro Services	126	1%
TOTAL EMPLOYEES	10,952	100%

Source: Campbell County Economic Development Corporation (2011).

population growth. The lowest rental vacancy rate estimate in Campbell County in recent years was 0.4%. In 2009 (most recent data), Campbell County had a total of 15,015 housing units, 8.1% of which were vacant (U.S. Census Bureau 2009). Of the occupied housing units, 77% were owned and 23% were rented. Temporary housing resources are available in the PRB in the form of hotel-motel rooms, private and public campgrounds, and vacant spaces in mobile home parks. In all, more than 70 lodging establishments with a total of more than 2,500 rooms are available in Gillette, Wright, and Douglas. Projected development in Campbell County indicates a strong demand for housing through 2020.

The average sale price of homes in Campbell County in 2007 was \$247,150. That represents a 23.6% increase over the average selling price in 2006, and the sixth highest rank among Wyoming counties (Wyoming Community Development Authority 2008). Monthly costs for hotels and other temporary housing rentals in the PRB, measured in the fourth quarter of 2006, were highest in Campbell County. By the second quarter of 2008, average apartment and housing rental costs ranged from \$318 to \$1,314 per month, depending on the size and structure of the rental property. In 2009, the median monthly housing cost for mortgaged homeowners was \$1,327 (U.S. Census Bureau 2009). For non-mortgaged homeowners and renters, that monthly cost was \$356 and \$762, respectively.

Environmental Justice

Environmental justice relates to actions that unequally impact a given segment of society, whether as a result of physical location, perception, design, noise, or other factors. The population of Campbell County and Wyoming for 2009 by race is displayed in Table 3-17. That year, the minority population in Campbell County was approximately 7.0% (U.S. Census Bureau 2009). By comparison, the minority population in Wyoming was 13%. In 2009, approximately 5.0% of the population of Campbell County was below the poverty level, compared with 9.6% of individuals in Wyoming, as a whole.

Table 3-17. 2009 population by race for Campbell County and Wyoming.

Race	Campbell County	Wyoming ¹
Total Population	40,290	523,949
Caucasian	93.3%	455,152 (87%)
Hispanic or Latino Origin	5.3%	39,783 (8%)
American Indian and Alaskan Native	1.0%	10,662 (2%)
Black or African American	0.6%	4,634 (0.9%)

Source: U.S. Census Bureau, 2005-2009 American Community Survey 5-year estimates (2009).

¹Wyoming data provided for races also present in Campbell County: Margin of error +/- 0.1-0.2

Executive Order 12898, titled “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,” was signed by President Clinton in early 1994 and requires federal agencies to identify and address disproportionately high and adverse human health or environmental effects of federal programs, policies, and activities on minority and low-income populations, including Native American tribes and populations. The Order requires the USFS to ensure effective public notification and access to information about proposed actions, to work to gain public participation in the analysis and decision processes, and to mitigate such effects if they could occur.

Public scoping for the Mackey Road project area included all local landowners and the general public (refer to complete scoping list in Chapter 4). All persons were contacted directly or otherwise made aware of the proposal. Participation was solicited from local landowners, representatives of county and tribal interests, and the general public in a manner consistent with USFS, agency, and departmental regulations and policy, and with government-to-government relationships between the United States and tribal governments.

Local Government Facilities, Services, and Utilities

The City of Gillette provides a wide array of governmental services including law enforcement, fire protection, road and bridge infrastructure, solid waste disposal, medical and ambulance, public libraries, and education. Schools, churches, shopping centers, and other services are located throughout the city. Numerous cultural and recreation opportunities also are available within the Gillette area, including public golf courses, public swimming pools, public parks, ball fields, recreation centers, civic center, and a museum. The Town of Wright provides many of the same facilities and services as the City of Gillette. The 1,000-acre CAM-PLEX Multi-Events

Facilities in Gillette feature a performing arts theater, a convention and exhibit hall, two large multipurpose pavilions, rodeo grounds, recreational vehicle campgrounds, a horse race track, and a 21-acre park and picnic area.

The public facilities and services, particularly the infrastructure, adequately serve the existing population and could support future growth. The City of Gillette provides residents and businesses with electric, water, sewer, and sanitation service. The town of Wright provides water, sewer, and sanitation services. Powder River Energy Corporation provides electric service to all areas of the county outside the Gillette city limits. KN Energy provides natural gas to the City of Gillette, Town of Wright, and some county residents. MGTC, a subsidiary of Western Gas Resources, also serves some residential and industrial natural gas customers in the county.

Environmental Consequences (Effects Analysis)

Alternative 1: No Action

Under the No Action alternative, the existing alignments of the Mackey County Road and the directly adjoining segment of the Temporary Reno Road will be retained, and no new road construction will occur. Mining will not occur under the approximately 6.1 miles of the existing Mackey County Road and 2.2 miles of existing Temporary Reno Road within the NARM permit area.

The No Action alternative will have no impact on management in the project area, but will impact social and economic resources in the region. This alternative excludes mining the coal beneath, or associated with, the proposed vacated road alignment. The main factor here is the loss of federal and state revenues of up to \$586,000,000.00. In addition, the loss of mining opportunities (jobs, housing, services, etc.), due to the lack of access to additional coal reserves associated with the proposed project, could impact the local population and possibly even the regional economy, in the long term. This alternative also is likely to affect local businesses, both directly and indirectly associated with local coal mines. Some people may lose jobs, and the opportunity for added job openings will be lost.

Alternative 2: Proposed Action

The Proposed Action will have no impact on current local homeowners or renters. The primary purpose of the project is relocate an existing county road to maintain public access to the general area and facilitate recovery of coal reserves within previously permitted mine operations. The Proposed Action will benefit the local economy by contributing to ongoing operations that will extend the life of the mine. The main factor here is the gain of federal and state revenues of up to \$586,000,000.00. Existing jobs will be maintained and additional jobs may become available as mine operations progress through the project area, thereby affecting local businesses. Furthermore, the Proposed Action also will add monetary benefits to the county, which in turn could feed programs that benefit the quality of life throughout local communities. The Proposed Action also will have a positive impact on local social systems by helping to maintain current programs and facilities.

After examining the possible environmental and human impacts of the Proposed Action, the Interdisciplinary Team and Forest Supervisor determined that no disproportionately high or

adverse human health or environmental effects will occur on minority or low income groups, or American Indian tribes, and that the public involvement efforts undertaken by the Interdisciplinary Team were adequate to have identified such groups if they exist, or had an interest in the project. Therefore, the Forest Supervisor's determination is that approving the Mackey Road Relocation project area will not result in disproportional social or economic adverse impacts to these groups. The Forest Supervisor also has determined that equal access opportunity for minorities and people with disabilities will be maintained at a level at or above that which is presently found to exist within the project analysis area. It is highly unlikely that a reduction in public use of NFS lands in that area by such persons or groups as a result of the implementation of the proposed project will occur due to the maintenance of public access afforded by the proposed project.

Cumulative Effects

Cumulative effects on economic and social systems are hard to quantify. Mining of coal reserves is an important part of TBNG activities and local economies. Social systems tend to change with or without any action on the part of the USFS. Implementing the No Action alternative may change the social system for mining, local employment, and county amenities. However, that alternative will probably have little effect on the overall system because mining will be sustained or increase at other adjacent and nearby properties in this portion of TBNG. If selecting the No Action alternative for future mining projects was to become a trend, then more serious negative cumulative effects will be likely.

Based on the individual resource cumulative effects above, the No Action alternative (Alternative 1) has the fewest cumulative impacts. However, that alternative will have the greatest effect on social and economic resources. The Proposed Action (Alternative 2) will have the most positive cumulative effect on social and economic aspects due to the sustained or potentially increased availability of job opportunities, added monetary benefits, and possible county and local community improvements.

Determination of Effects and Rationale

The No Action alternative will have **no impact** on management in the project area, but **will impact** social and economic resources in the region.

The Proposed Action will have **no impact** on current local homeowners or renters. It will **benefit** the local economy by contributing to ongoing operations that will extend the life of the mine. The Proposed Action also will have a **positive impact** on local social systems by helping to maintain current programs and facilities.

Short-Term Use/Long-Term Productivity, Unavoidable Adverse Impacts, Irreversible or Irretrievable Impacts on Socio-economic Resources

No loss in long-term productivity is expected under either alternative.

No unavoidable adverse effects are expected under either alternative.

No irreversible or irretrievable impacts on economic and social conditions will occur under either alternative.

CHAPTER 4. CONSULTATION AND COORDINATION

The USFS consulted with the following individuals, organizations, and federal, state, and local agencies during the development of this EIS:

4.1 Consultation and Coordination

Federal, State, and Local Agencies

Bureau of Land Management (Casper and Buffalo Field Offices)
Campbell County Commissioners
Cheyenne and Arapaho Tribes of Oklahoma
Cheyenne River Sioux Tribe
Crow Creek Sioux Tribe
Crow Tribal Council
Department of Agriculture-Natural Resources Division
Eastern Shoshone Tribe
Environmental Protection Agency
Lower Brule Sioux Tribe
Northern Arapaho Tribe
Northern Cheyenne Tribe
Office of State Lands and Investments-Forestry Division
Oglala Sioux Tribe
Rosebud Sioux Tribe
Standing Rock Sioux Tribe
State Engineer's Office
Three Affiliated Tribes
US Fish and Wildlife Services-Buffalo Field Office
US Fish and Wildlife Service-Ecological Services Office
U.S. Representative Barbara Cubin
U.S. Senator John Barrasso
U.S. Senator Michael Enzi
Water Development Commission
Wyoming Business Council
Wyoming Department of Environmental Quality-Air Quality Division
Wyoming Department of Environmental Quality-Land Quality Division
Wyoming Department of Environmental Quality-Water Quality Division
Wyoming Department of Revenue-Ad Valorem Tax
Wyoming Department of State Parks and Cultural Resources Historic Sites Division
Wyoming Game and Fish Department
Wyoming Livestock Board
Wyoming State Forestry
Wyoming State Historic Preservation Office
Wyoming State Planning Office
Wyoming State Trails Program

Individuals and Organizations

Big Horn Audubon Society
Biodiversity Conservaton Alliance
CBMCC
Dilts, Jerry
Funk, Wendell
Land and Water Fund of the Rockies
Litton, Patricia
National Wildlife Federation
Oil and Gas Conservation Commission
Pellatz, Donald
Powder River Basin Resource Council
Sierra Club Northern Plains
SINAPU
Stoddard, Robert
Stuart, James
Thunder Basin Grazing Association
Thunder Basin Resource Coalition
Tracy, Dan
Wind River Multi-Use Advocates
Wyodak Resources Development Corportation
Wyoming Outdoor Council
Wyoming Professional Association of Archaeologists
Wyoming Stockgrowers' Association
Wyoming Travel and Tourism
Wyoming Wildlife Federation

4.2 List of Preparers

Interdisciplinary Team Leader: Amy Ormseth

Forest Service Specialists:

Aquatics — Shawn Anderson
Botany — Katherine Haynes
Engineering — Anne Haverhals
Fire/Fuels — Clay Westbrook
Fluid Minerals — Amy Ormseth
Heritage — Amanda Sanchez
Hydrology — Carol Purchase
Lands/Realty — Geri Proctor
NEPA — Allen Hambrick
Paleontology — Peter Rose
Range — Moriah Shadwick
Recreation — Marcia Rose-Ritchie
Solid Minerals — Amy Ormseth
Social and Economics — Allen Hambrick

Soils — Randy Tepler
Visuals — Jeff Tupala
Wildlife — Cristi Painter

BKS Environmental Associates, Inc. Specialists (Vegetation, Soils):

Katie Wilson, Dawn Gardner, Clay Wood

GCM Services Specialist (Cultural):

David Ferguson, Garren Meyer

Knight Technologies, Inc. Specialist (Wetlands):

Melody Smith

McVehil-Monnett Associates, Inc. Specialists (Air Quality):

Jim Easton, John Gilpin

Thunderbird Wildlife Consulting, Inc. Specialist (Wildlife, 3rd Party Contractor):

Gwyn McKee

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APPENDIX 1
TBNG LAND AND RESOURCE MANAGEMENT PLAN
GOALS AND OBJECTIVES, STANDARDS, AND
GUIDELINES APPLICABLE TO THE MACKEY ROAD
RELOCATION PROJECT

Goal 1: Ensure Sustainable Ecosystems

Goal 1.b: Provide ecological conditions to sustain viable populations of native and desired non-native species and to achieve objectives for Management Indicator Species (MIS).

Objectives:

2. Within 15 years, demonstrate positive trends in population viability, habitat availability, habitat quality, population distribution throughout the species range within the planning area, and other factors affecting threatened, endangered, sensitive species and MIS.
9. Conduct target surveys for globally rare plant species (Barr's milkvetch, smooth goosefoot, Ute ladies' tresses) and other rare plant species with viability concerns.

Goal 2: Multiple Benefits to People

Goal 2.c: Improve the capability of the Nation's forests and grasslands to provide a desired sustainable level of uses, values, products, and services.

Mineral and Energy Resources

Objective:

2. Honor all valid existing legal mineral rights.

Scenery

Objective:

1. Implement practices that will meet, or move the landscape character toward scenic integrity objectives. Reference Geographic Area direction.

Special Uses

Objective:

1. Ensure all special use permits are meeting requirements for customer service and are in compliance with the terms of their permits or contracts.

Goal 4: Effective Public Service

Goal 4.a: Improve the safety and economy of the USDA Forest Service roads, trails, facilities, and operations and provide greater security for the public and employees.

Objective:

1. Within 5 years, identify travel opportunities and restrictions, including designating motorized travel-ways and areas, to meet land management objectives. Provide reasonable access for use of national grasslands and national forests.

Physical Resources

A. Air

1. Conduct all land management activities in such a manner as to comply with all applicable federal, state, and local air-quality standards and regulations including: Federal Clean Air Act, as amended, 1990 (42 USC 7401-7671); North Dakota Air Pollution Control Law, (33-15-02); and South Dakota Air Pollution Control Program (Title 74, #36). **Standard**
2. Meet requirements of the Prevention of Significant Deterioration (PSD), State Implementation Plans (SIP), and applicable Smoke Management Plans. **Standard**
3. Ensure emissions from projects on the Grassland and forest management activities are within Class I or Class II ranges. (See USFS Appendix A regarding Class I Areas.) **Standard**

(See Geology and Minerals; Leaseable Minerals section to find air standards and guidelines related to mineral operations.)

B. Water

4. Design and construct all stream crossings and other instream structures to provide for passage of flow and sediment, withstand expected flood flows, and allow free movement of resident aquatic life. **Standard**
9. Construct roads and other disturbed sites to minimize sediment discharge into streams, lakes, and wetlands. **Standard**
14. Locate activities and facilities away from the water's edge or outside the riparian areas, woody draws, wetlands, and floodplains unless alternatives have been assessed and determined to be more environmentally damaging. If necessary to locate activities or facilities in these areas, then:
 - Deposit no waste material (silt, sand, gravel, soil, slash, debris, chemical, or other material) below high water lines, in riparian areas, in the areas immediately adjacent to riparian areas or in natural drainage ways (draws, land surface depressions or other areas where overland flow concentrates and flows directly into streams or lakes).
 - Prohibit deposition of soil material in natural drainage ways.
 - Locate the lower edge of disturbed or deposited soil banks outside the active floodplain.
 - Prohibit stockpiling of topsoil or any other disturbed soil in the active floodplain.
 - Locate drilling mud pits outside riparian areas, wetlands and floodplains. If location is unavoidable in these areas, seal and dike all pits to prevent leakage.
 - Rehabilitate gravel pits, if located in riparian zones, to simulate a natural riparian/aquatic situation. **Guideline**

15. Do not allow new roads to parallel streams when road location must occur in riparian areas unless alternatives have been assessed and determined to be more environmentally damaging. Cross streams at right angles. Locate crossings at points of low bank slope and firm surfaces. **Standard**

(See the Water Conservation Practices Handbook, Forest Service Handbook [FSH] 2509.25, TBNG LRMP for further information.)

C. Soils

1. Limit roads and other disturbed sites to the minimum feasible number, width, and total length consistent with the purpose of specific operations, local topography, and climate. **Standard**
2. Stabilize and maintain roads and other disturbed sites during and after construction to control erosion. **Standard**
3. Reclaim roads and other disturbed sites when use ends, as needed, to prevent resource damage. **Standard**
4. Prohibit soil-disturbing activities (e.g., road construction, well pad construction) on slopes greater than 40 percent and on soils susceptible to mass failure. **Guideline**

(See the FSH 2509.18 Soil Management Handbook R2 Supplement No. 2509.18-92-1 for further information.)

D. Minerals and Energy Resources

Geophysical Operations

4. Where no suitable mitigation measures are possible, prohibit geophysical (seismic) operations that cause surface disturbance in Research Natural Areas, Special Interest Areas, American Indian traditional use area, and known National Register eligible sites. **Standard**

Energy and Mineral-Related Special Uses

14. Minimize disturbance by co-locating roads, pipelines, gathering lines, and power lines for energy resource development. **Guideline**

E. Paleontological Resources

1. Protect key paleontological resources (Classes 3, 4, and 5 of the Fossil Potential Classification) from disturbance, or mitigate the effects of disturbance, to conserve scientific, interpretive, and legacy values (see Paleontological Appendix J for details [refers to appendix in USDA Forest Service 2002]). **Standard**
3. Prior to ground-disturbing activities, conduct paleontological surveys in any area where there is a high potential to encounter these resources according to the process outlined in Appendix J [refers to appendix in USDA Forest Service 2002]. **Standard**

Biological Resources

F. Fish, Wildlife, and Rare Plants Threatened, Endangered, and Proposed Species

Given the absence of black-footed ferret populations, limited potential habitat for ferrets within the analysis area, limited disturbance (2% of total active prairie dog colony acreage in the analysis area) in potential ferret habitat, the USFWS block clearance for ferrets in black-tailed prairie dog colonies throughout Wyoming, and the fact that the project area is not in a location identified as a black-footed ferret Management Area by the USFS, no black-footed ferrets or potential ferret habitat will be disturbed by this project. Therefore, no Standards and Guidelines stipulated in the Grassland Plan (USFS 2002) will be required for this species.

To help protect federally listed species, the operator will notify the District Ranger, Douglas Ranger District, of any federally listed species, in addition to those identified in this Biological Evaluation, documented during construction or operation of this project.

Mountain Plover

25. To help maintain suitable nesting habitat for mountain plover, prohibit development of new facilities within 0.25 miles of known mountain plover nests or nesting areas. This does not apply to pipelines, fences and underground utilities. **Standard**
28. To help reduce disturbances and risks to nesting mountain plover, prohibit the following activities in plover nesting areas or within 0.25 mile of plover nests from March 15 through July 31:
 - Construction (e.g., roads, water impoundments, oil and gas facilities),
 - Reclamation,
 - Seismic exploration,
 - Gravel mining operations,
 - Oil and Gas drilling,
 - Drilling of waterwells,
 - Prescribed burning. **Standard**
29. To help reduce disturbances and risks to nesting mountain plover, do not authorize the following activities in plover nesting areas or within 0.25 mile of plover nests from March 15 through July 31:
 - Construction (e.g., pipelines, utilities, fencing),
 - Workover operations for maintenance of oil and gas wells,
 - Permitted recreation events involving large groups of people,
 - Grasshopper spraying,
 - Prairie dog shooting (in consultation with state wildlife agencies and U.S. Fish and Wildlife Service). **Guideline**

31. To help reduce risks to mountain plovers from traffic, limit vehicle speeds in occupied mountain plover habitat to 25 mph on resource roads and 35 mph on local roads. **Standard**

Sensitive Plant and Animal Species

35. Do not authorize new facilities, roads, trails, fences, salting and mineral areas, water developments in habitat occupied by sensitive plant species. **Guideline**
37. Identify sensitive plant habitats and rare plant communities as priorities for invasive plant monitoring and control. **Guideline**
38. Avoid the use of invasive plant control methods that may negatively impact sensitive plants. **Guideline**

Sage Grouse

46. To help reduce adverse impacts on breeding sage-grouse and their display grounds, prohibit construction of new oil and gas facilities within 0.25 miles of active display grounds. A display ground is no longer considered active if it's known to have been unoccupied during the past 5 breeding seasons. This does not apply to pipelines and underground utilities. **Standard**
47. To help reduce disturbances to nesting sage grouse, prohibit the following activities within 2.0 miles of active display grounds from March 1 to June 15:
Construction (e.g., roads, water impoundments, oil and gas facilities),
Reclamation,
Gravel mining operations,
Drilling of water wells,
Oil and gas drilling,
Training of hunting dogs. **Standard**
48. To reduce disturbances to nesting sage grouse, do not authorize the following activities within 2.0 miles of active display grounds from March 1 to June 15:
Construction (e.g., pipelines, utilities, fencing),
Seismic exploration,
Workover operations for maintenance of oil and gas wells,
Permitted recreation events involving large groups of people. **Guideline**
49. To help prevent reproductive failure, limit noise on sage grouse display grounds from nearby facilities and activities to 49 decibels (10 dBA above background noise) from March 1 to June 15. **Guideline**

51. When constructing facilities or structures within 2 miles of a sage grouse active display ground, design them to discourage raptor perching by maintaining a low profile or using perch inhibitors. **Guideline**
52. Prohibit development or operations of facilities within 2 miles of a sage grouse display ground if these activities would exceed a noise level of more than 10 decibels above the background noise level (39 db), at 800 feet from the noise source, from March 1 to June 15. **Guideline**
63. Proximity to sage-grouse display grounds. **Guideline**

Burrowing Owls

65. To optimize habitat for burrowing owls, manage for active prairie dog colonies that are larger than 80 acres. **Guideline**

Black-tailed Prairie Dog

69. To reduce risks and habitat loss for prairie dogs and other wildlife species closely associated with prairie dog colonies, align new roads outside prairie dog colonies. If it's necessary to place a new road in a prairie dog colony, minimize the amount of road within the colony to the extent that soil, drainage, topographical and other physical factors will allow. **Guideline**

Swift Fox

70. To reduce disturbances to swift fox during the breeding and whelping seasons, prohibit the following activities within 0.25 miles of their dens from March 1 to August 31:
- Construction (e.g., roads, water impoundments, oil and gas facilities),
 - Reclamation,
 - Gravel mining operations,
 - Drilling of water wells,
 - Oil and gas drilling. **Standard**
71. To reduce disturbances to swift fox during the breeding and whelping seasons, do not authorize the following activities within 0.25 miles of their dens from March 1 to August 31:
- Construction (e.g., pipelines, utilities, fencing)
 - Seismic exploration,

- Workover operation for maintenance of oil and gas wells,
- Permitted recreation events involving large groups of people. **Guideline**

Raptors

76. To help prevent abandonment, reproductive failure or nest destruction, prohibit development of new facilities within the minimum distances (line of sight) of active raptor nests and winter roost sites as specified in the following table. For the bald eagle, golden eagle, merlin, ferruginous hawk and Swainson's hawk, a nest is no longer considered active if it is known to have been unoccupied for the last 7 years. For the burrowing owl and other raptor species, a nest is no longer considered active if it is known to have been unoccupied during the current or most recent nesting season. This does not apply to pipelines, fences and underground utilities. **Standard**

Species and Habitat	Minimum Distance (miles)
Bald Eagle Nest	1.0
Bald Eagle Winter Roost Area	1.0
Golden Eagle Nest	0.25
Merlin Nest	0.25
Ferruginous Hawk Nest	0.25
Swainson's Hawk Nest	0.25
Burrowing Owl Nest	0.25
Nests of Other Raptors	0.125

Note: This table is from Chapter 1: Grassland-wide Direction of the Thunder Basin National Grassland Forest Plan (2002).

77. To help reduce disturbances to nesting and wintering raptors, prohibit the following activities within the minimum distances (line of sight) of active raptor nests and winter roost areas during the dates specified in the table below:
- Construction (e.g., roads, water impoundments, oil and gas facilities),
 Reclamation,
 Gravel mining operations,
 Drilling of water wells,
 Oil and gas drilling,
 Timber harvest and fuel treatments,
 Precommercial thinning. **Standard**

Species and Habitat	Minimum Distance (miles) and Dates
Bald Eagle Nest	1.0 from 2/1 to 7/31
Bald Eagle Winter Roost Area	1.0 from 11/1 to 3/31
Golden Eagle Nest	0.50 from 2/1 to 7/31
Merlin Nest	0.50 from 4/1 to 8/15
Ferruginous Hawk Nest	0.50 from 3/1 to 7/31
Swainson's Hawk Nest	0.50 from 3/1 to 7/31
Burrowing Owl Nest	0.25 from 4/15 to 8/31
Nests of Other Raptors	0.125 from 2/1 to 7/31 ^a

^a Dates may vary depending on the species.

Note: This table is from Chapter 1: Grassland-wide Direction of the Thunder Basin National Grassland Forest Plan (2002).

78. To help reduce disturbances to nesting and wintering raptors, do not authorize the following activities within the minimum distances (line of sight) of active raptor nests and winter roost areas during the dates specified in the previous table:

Construction (e.g., pipelines, utilities, fencing),

Seismic exploration,

Workover operations for maintenance of oil and gas wells,

Fuelwood cutting,

Permitted recreation events involving large groups of people. **Guideline**

79. If a winter roost area or nest site is discovered, ensure that the necessary habitat components are maintained, including maintenance and regeneration of woodlands. **Standard**

J. Noxious Weeds, Non-native, and Invasive Species

2. To prevent the spread of undesirable non-native and invasive plant species, include necessary provisions in contracts and permits for use of the National Grasslands and its resources.

Standard

5. Allow only certified noxious weed seed-free products for animal feed or re-vegetation projects. This includes use of certified hay or straw, and heat-treated, or other appropriately processed products. **Standard**

7. Where technically and economically feasible, use genetically local (at the ecological subsection level) native plant species in re-vegetation efforts. To prevent soil erosion, non-native annuals or sterile perennial species may be used while native perennials are becoming established. **Guideline**

Administration

N. Heritage Resources

7. Limit non-research oriented ground-disturbing activities on heritage districts and sites eligible for the National Register Historic Preservation (NRHP) that creates adverse impacts to the district or site. **Guideline**

P. Special Uses

6. Route new roads, pipelines, gathering lines, and technically required overhead power lines in a manner as to minimize visual impacts and conform to approved corridors. When these facilities leave corridors, they should be subordinate to the landscape (see Scenic Integrity in Glossary [refers to glossary in USDA Forest Service 2002]). **Guideline**
9. Don't approve land-use authorizations identified for disposal if that occupancy will affect disposal action. **Standard**
10. Act on special-use applications according to the following priorities:
 - Land and land-use activity requests relating to public safety, health and welfare, e.g., highways, power lines and public service improvements.
 - Land and land-use activities contributing to increased economic activity associated with Grassland National Forest System resources, e.g., oil and gas and energy minerals.
 - Land and land-use activities that benefit only private users, e.g., road permits, rights-of-way for power lines, telephones, waterlines, etc. **Guideline**
14. Don't approve any special-use applications that can reasonably be met on private or other federal lands unless it is clearly in the public interest. **Guideline**

Q. Infrastructure Use and Management

4. Perform site-specific Roads Analysis, including public involvement, prior to making any decisions on road construction, reconstruction, and decommissioning. **Guideline**
5. Do not invest in new facilities on lands meeting the criteria for disposal. **Guideline**
6. Build new and reconstructed fences to provide for access for other uses such as big game movement, recreation, fire protection, and mineral development. **Guideline**

Highlight Bill Geographic Area

Sage-grouse (MIS)

1. Provide diverse and quality sagebrush habitat across the geographic area at levels that, in combination with habitat on adjoining lands helps support stable to increasing populations of sage-grouse and other wildlife with similar habitat needs. **Objective**

2. Establish and maintain quality nesting habitat for sage-grouse and associated wildlife by meeting vegetation objectives for high structure sagebrush understories within 10 years.
Objective

Broken Hills Geographic Area

Black-tailed Prairie Dog (MIS)

1. Maintain an increasing trend of black-tailed prairie dog populations across the geographic area over the next 10 to 15 years. **Objective**
2. Maintain and expand the current distribution of black-tailed prairie dogs across the geographic area over the next 10 to 15 years. **Objective**

Sage-grouse (MIS)

1. Provide diverse and quality sagebrush habitat across the geographic area at levels that, in combination with habitat on adjoining lands, helps support stable to increasing populations of sage-grouse and other wildlife with similar habitat needs. **Objective**
2. Establish and maintain quality nesting habitat for sage-grouse and associated wildlife by meeting vegetation objectives for high structure sagebrush understories within 10 years.
Objective

APPENDIX 2

KEY PUBLIC COMMENTS

Mackey Road Relocation: USFS Responses to Key Public Comments on the Draft Environmental Impact Statement for the Mackey Road Relocation Project

The Douglas Ranger District received public comments on the draft environmental impact statement from the two entities shown below. No additional comments were received from other individuals, groups, governmental agencies, or tribes. The following numbered list corresponds to the Comment and Response Table, below. These letters, emails, and phone call notes are located in the project file. The input received was summarized in the table below and is not always presented verbatim.

1. Wyoming Game and Fish Department
2. Environmental Protection Agency

Comment(er) Number	Comment	Response
1A	Recommend the new road route maintain a minimum of ¼ mile distance from the Tracy Waterhole sage-grouse lek as it is in non-core habitat.	The proposed alternative will be located a minimum of 0.5 mile from, and likely beyond view of, this sage-grouse lek.
1B	Road construction should happen outside the March 15-June 30 seasonal stipulation period for sage-grouse.	Current TBNG Plan standard for sage-grouse is March 1-June 15. Applied based on local conditions. Anticipated construction timeline is outside all seasonal stipulation periods.
1C	Implement accepted BMPs to ensure that all sediments and pollutants are contained within the boundaries of the work area. Promptly re-vegetate disturbed areas that are contributing sediment to surface waters to maintain water quality.	Authorization will require adequate use of sediment control and re-vegetation practices to protect the resource and will include appropriate BMPs.
1D	Equipment staging, fueling, and servicing should happen at least 300 feet from riparian areas.	Authorization will include appropriate BMPs.

Comment(er) Number	Comment	Response
1E	If equipment has been used in high risk infested water for zebra/quagga mussels, it should be inspected by an authorized aquatic invasive species inspector prior to use in any Wyoming waters.	Authorization will include appropriate BMPs.
1F	Any equipment entering the state by land from March through November must be inspected by an authorized aquatic invasive species inspector prior to use in any Wyoming waters.	Authorization will include appropriate BMPs.
1G	If aquatic invasive species are found, the equipment will need to be decontaminated by an authorized aquatic invasive species inspector.	Authorization will include appropriate BMPs.
1H	Any time equipment is moved from one 4 th level Hydrological Unit Code watershed to another, recommend drain all water, and thoroughly clean and dry all equipment per WGFD guidelines.	Authorization will include appropriate BMPs.
2A	Document appears to be missing maps and/or suggest other maps to better disclose location of potential impacts.	Corrections to citations for exhibits (maps) were made in the FEIS along with ensuring that all appropriate exhibits were included in the FEIS. TBNG Geographic and Management areas are depicted on the Alternative 3 map for the final EIS (2000) for the Medicine Bow/Routt National Forest/TBNG, available from the Douglas Ranger District.

Comment(er) Number	Comment	Response
2B	Unclear whether the single proposed action and no action alternative present an adequate range of alternatives. Recommend that Section 2.2 –Alternatives Considered but Eliminated from Detailed Study be expanded in the FEIS to describe the alternatives that were considered but dismissed, including citing the reasons for dismissal for each, as required by 40CFR 1502.14(a).	Section 2.2 was modified to clarify and address the requested information.
2C	Recommend that the USFS develop additional mitigation measures in the FEIS to aid in meeting the management area objectives for improving grazing and wildlife habitat in the area surrounding the new road ROW.	The FEIS and the ROD will clearly define all mitigation measures that will be applied.
2D	Recommend consulting with the US Army Corps of Engineers prior to the FEIS, and providing additional information in the FEIS to explain more fully how the wetland impacts will be permitted under Section 404.	The DEIS should have stated that only 0.15 acre of the 1.4 acres of jurisdictional wetlands within the project area will be disturbed by the proposed project; this was corrected in the FEIS. The USACOE has previously stated that this disturbance will be addressed under a NWP 14, which the proponent will obtain prior to disturbance. The USACOE did not provide any additional comments on the DEIS. The USFS does not have authority over this permit process other than requiring in our decision and authorization and monitoring that the proponent seeks the appropriate Local, State, and Federal permits required for the completion of the project.

Comment(er) Number	Comment	Response
2E	Recommend that the FEIS identify potential wetlands mitigation sites and determine whether a greater than one-to-one mitigation ratio would be appropriate.	The USACOE has previously stated that a 1:1 ratio is appropriate for this project because the proposed mitigation site is immediately adjacent to the proposed disturbance area on Little Thunder Creek. Section 3.7 (Hydrology) of the FEIS was enhanced to more clearly explain potential impacts to wetlands and proposed mitigation for those impacts.

APPENDIX 3

EXHIBITS (MAPS)

Exhibit A: Mackey Road Relocation Route Overview

T. 42 N. - T. 43 N. and R. 69 W., 6th P.M., Campbell County

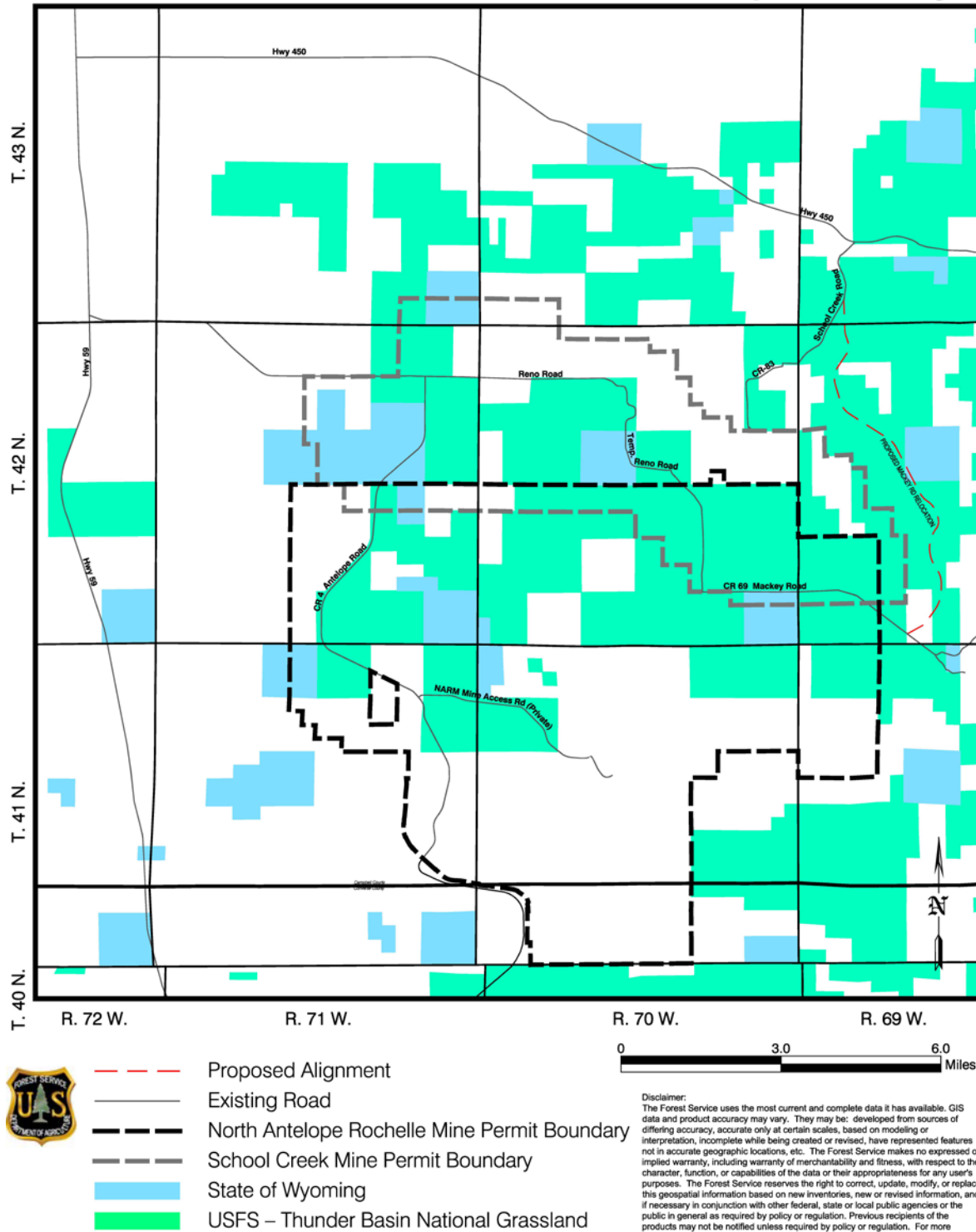
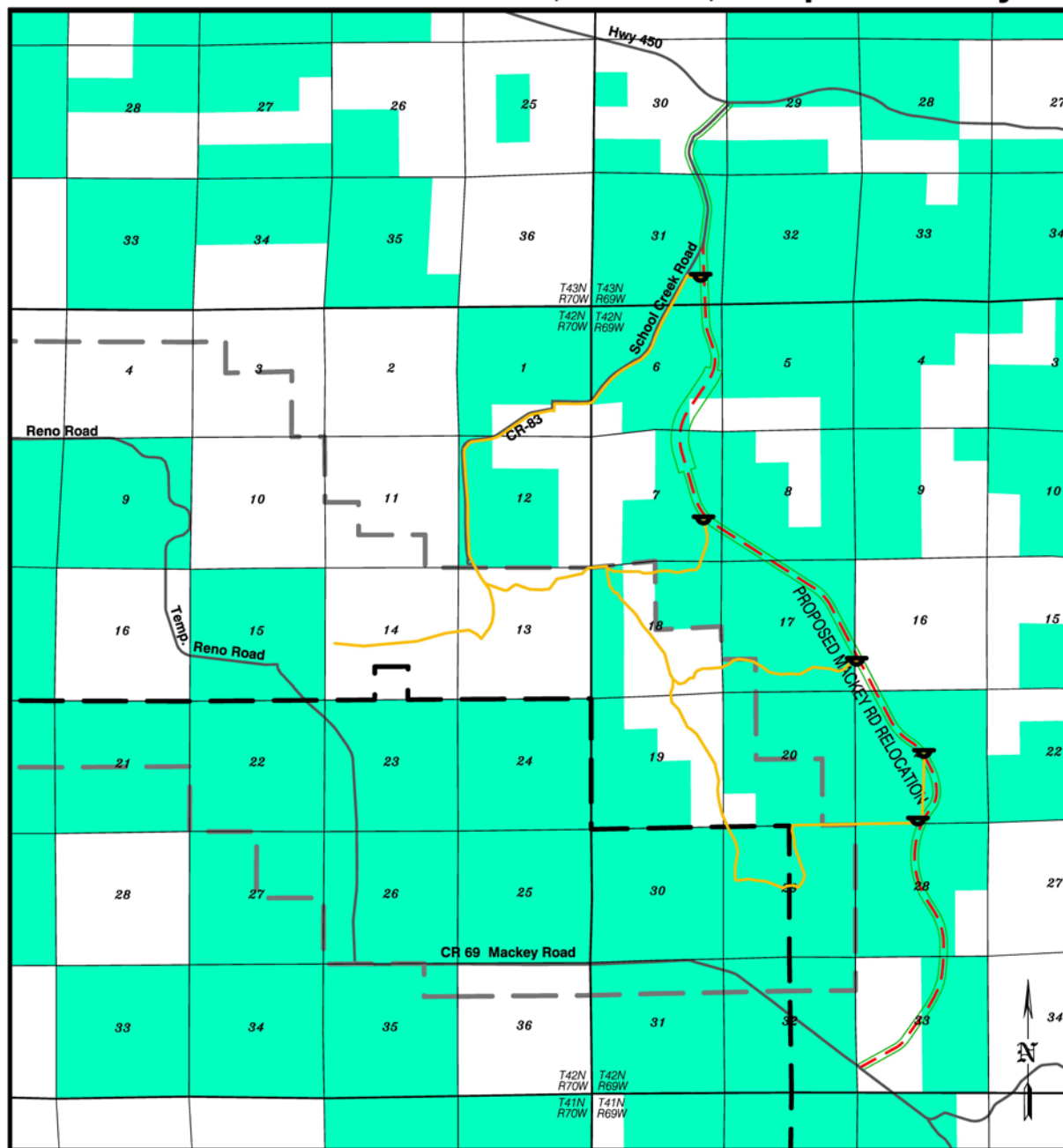


Exhibit B: Mackey Road Relocation Route T. 42 N. - T. 43 N. and R. 69 W., 6th P.M., Campbell County

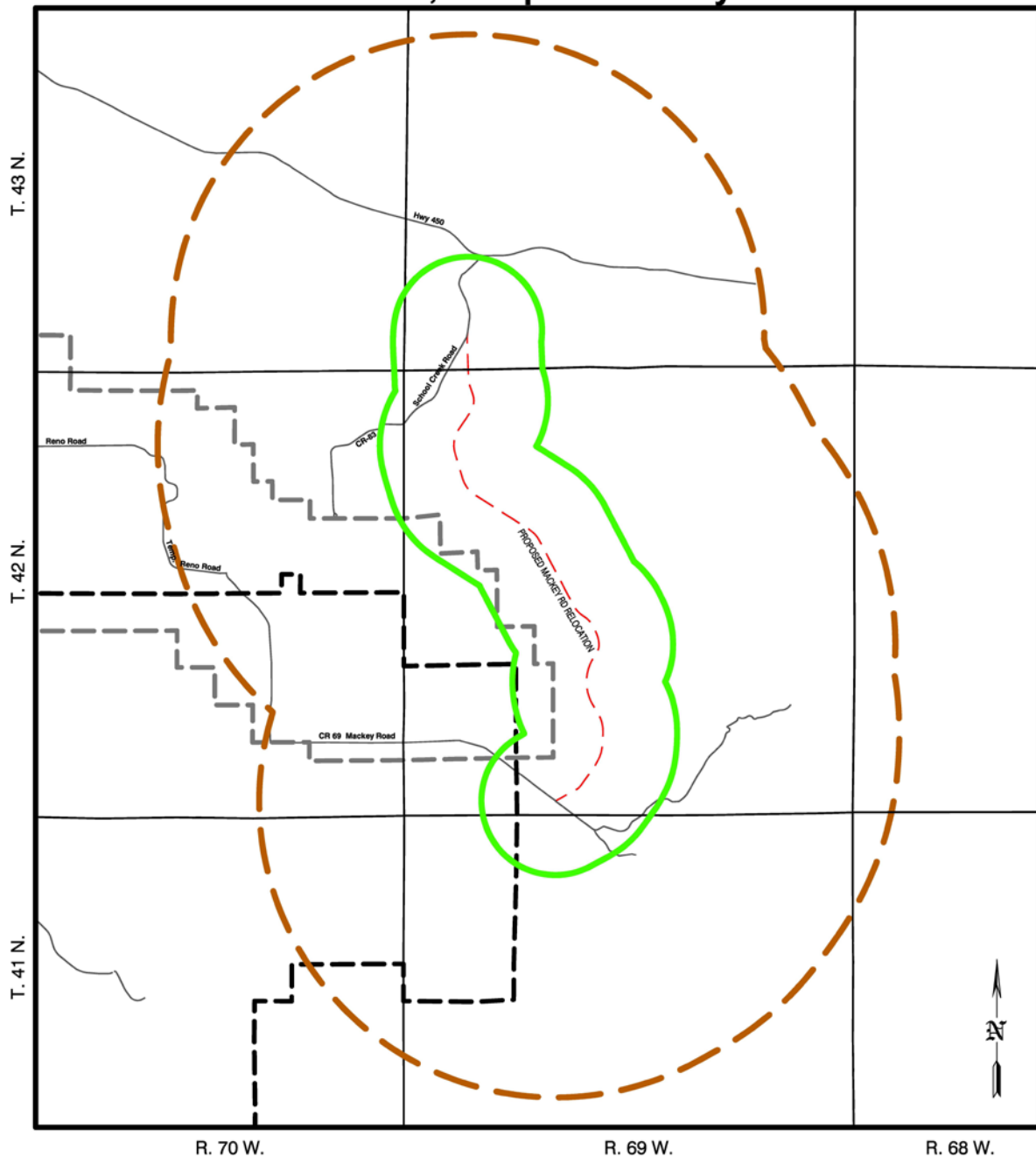


- Proposed Alignment
- Construction Corridor
- Existing Road
- North Antelope Rochelle Mine Permit Boundary
- Approximate Water Line Location
- Water Supply Sump
- School Creek Mine Permit Boundary
- USFS – Thunder Basin National Grassland

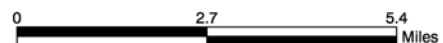
0 1.3 2.6
Miles

Disclaimer:
The Forest Service uses the most current and complete data it has available. GIS data and product accuracy may vary. They may be developed from sources of differing accuracy, accurate only at certain scales, based on modeling or interpretation, incomplete while being created or revised, have represented features not in accurate geographic locations, etc. The Forest Service makes no expressed or implied warranty, including warranty of merchantability and fitness, with respect to the character, function, or capabilities of the data or their appropriateness for any user's purposes. The Forest Service reserves the right to correct, update, modify, or replace this geospatial information based on new inventories, new or revised information, and if necessary in conjunction with other federal, state or local public agencies or the public in general as required by policy or regulation. Previous recipients of the products may not be notified unless required by policy or regulation. For more information, contact the Medicine Bow - Routt National Forests and Thunder Basin National Grassland Supervisor's Office (2468 Jackson Street, Laramie, WY 82070, 307-745-2300).

Exhibit C: Mackey Road Relocation Wildlife Survey Perimeters **T. 41 N. - T. 43 N. and R. 68 W. - R. 70 W.,** **6th P.M., Campbell County**



- Proposed Alignment
- Existing Road
- 1 Mile Survey Area
- 4 Mile Survey Area
- North Antelope Rochelle Mine Permit Boundary
- School Creek Mine Permit Boundary



Disclaimer:
The Forest Service uses the most current and complete data it has available. GIS data and product accuracy may vary. They may be: developed from sources of differing accuracy, accurate only at certain scales, based on modeling or interpretation, incomplete while being created or revised, have represented features not in accurate geographic locations, etc. The Forest Service makes no expressed or implied warranty, including warranty of merchantability and fitness, with respect to the character, function, or capabilities of the data or their appropriateness for any user's purposes. The Forest Service reserves the right to correct, update, modify, or replace this geospatial information based on new inventories, new or revised information, and if necessary in conjunction with other federal, state or local public agencies or the public in general as required by policy or regulation. Previous recipients of the products may not be notified unless required by policy or regulation. For more information, contact the Medicine Bow - Routt National Forests and Thunder Basin National Grassland Supervisor's Office (2456 Jackson Street, Laramie, WY 82070, 307-745-2300).